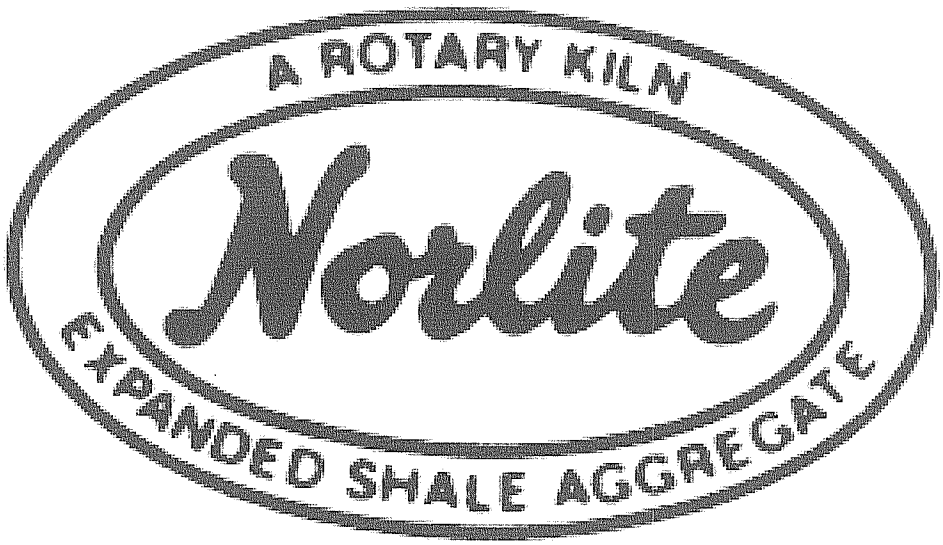

STANDARD OPERATING PROCEDURES

THIS DOCUMENT HAS BEEN ASSIGNED A CONTROL NUMBER OF: SOP903-04.

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Table of Contents for Norlite SSMP-SOP's
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Operating and Maintenance Plan

NORLITE CORPORATON
Policy Number: SSMP 1-01
Effective Date: 9/03

STANDARD OPERATING PROCEDURE (SOP'S): DEVELOPMENT OF SOP'S

I. PURPOSE

To provide an effective way for developing and implementing Standard Operating Procedures (SOP's) for Norlite Corporation's plant operations and systems.

II. SCOPE

All Norlite Corporation Employees and Contractors.

III. RESONSIBILITIES

A. The plant manager is responsible for approving all SOP's.

B. The department managers and supervisors are responsible for developing and implementing the SOP's.

C. Employees are responsible for following the SOP's.

III. PROCEDURES

GENERAL

SOP's are used as a means of communicating a written standard for each specific job function for any system or operation. SOP's should be developed in a way that effectively offers the employees a compliant, productive and safe means of operation.

The development of SOP's should be done in the following manner:

1. Identify the task or job function that needs to be performed.
2. Select responsible individual(s) to prepare the SOP.
3. Gather input from managers, supervisors and field personnel that will be involved in performing the task.
4. Analyze task for environmental, operational and safety issues.
5. Prepare a list of criteria from start to finish that must be followed to complete task.
6. Organize criteria and comments into concise steps that will accomplish task.
7. Review criteria and receive additional comments from personnel.
8. Prepare SOP as a SOP document. (see Attachment A as example of SOP layout)
9. Submit SOP for approval to next level of management.
10. After approval, incorporate SOP into operating manuals and train effected employees.

NORLITE CORPORATON
Policy Number: SSMP 1-02
Effective Date: 9/03
Revision Dates:

DOCUMENT CONTROL LOG (DCL)
DOCUMENT CONTROL FILE (DCF)

I. PURPOSE

A system to track and manage data associated with projects, periodicals, permits and library reports.

II. SCOPE

All Norlite Corporation employees.

III. RESONSIBILITIES

All persons filing and/or retrieving data from the DCL and DCF.

PROCEDURES

1. Determine whether you have a Project, Periodical, Permit, or a Library Report.
   a. A **Project** is a task that involves an exchange of information, which has an expected conclusion date (end date). Project numbers will begin with 2000 and continue in sequence.

   b. A **Periodical** is an on going exchange of information, such as quarterly reports, manifest inquiries, or annual reports. Periodicals will be numbered in the 1000 series.

   c. A **Permit** is a written warrant or license granted by one having authority which includes information such as permit application, renewals, and modifications. Permit numbers will begin with 3000 and continue in sequence.

   d. A **Library Report** is a bound report. Library reports will be labeled as a volume and will begin with 100 and continue in sequence.

2. When submitting documents for either a project, periodical, or a permit DCL Number, you must provide the following information:
   a. Project Title
   b. Whether the information is in-coming, out-going or internal.
   c. Initiation date
   d. Point of Contact (POC) individual
   e. Any notes or comments

3. When adding bound reports to the library for a Volume Number, you must Provide the following information:

a. Report Title
b. Whether report is in-coming, out-going, or internal
c. Date of report
d. Point of Contact (POC) individual
e. Notes or comments

Projects:

1. Acquire a Project Number from the Compliance Administrative Assistant and **remit all original documents** to be filed in the DCF.

2. All documents such as letters, telephone logs, faxes, electronic mail and reports will have a Document ID. As documents are received and generated, they will promptly be remitted to the DCF, and working copies are to be made as necessary. Telephone logs can be obtained from the DCL or electronically from the Compliance Administrative Assistant.

3. The Document ID will consist of the Project Number followed by a letter in alphabetical sequence (i.e. 2000a, 2000b). **The Document ID Number must be clearly marked on the corresponding document**

Periodicals:

1. Acquire a Periodical Number from the Compliance Administrative Assistant.

2. Each completed report (i.e. monthly, quarterly, yearly) will receive a Document ID Number.

3. The Document ID will consist of the Periodical Number followed by a letter in alphabetical sequence (i.e. 1000a, 1000b). **The Document ID must be clearly marked on the corresponding document.**

4. In the event additional information regarding a periodical is requested, the Point of Contact (POC) individual will need to determine:
   a. To include the supporting documentation with the existing periodical, and issue a Document ID - OR –
   b. To create a new project by issuing a new Project Number.

Permits:

1. Acquire a Permit Number from the Compliance Administrative Assistant and **remit all original Permit documents** to be filed in the Permit Document file,

2. All official documents will have a Document ID. As documents are received and generated, they will promptly be remitted to the document file, and working copies are to be made as necessary.

3. The Document ID will consist of the Permit Number followed by a letter in alphabetical sequence (i.e. 3000a, 3000b). **The Document ID Number must be clearly marked on the corresponding document.**

Library:

1. Acquire a volume Number from the Compliance Administrative Assistant and **remit all original reports** to be added to the "Bookshelf."

2. The Bound Report ID will consist of the Volume Number followed by a Copy Number (i.e. 100 copy: 1 of 2, 100 copy: 2 of 2). The Report will be documented in the Library section of the DCL book for easy reference.

File Management:

1. The DCL, along with the active projects, permits, and appropriate periodicals, will be stored in the file cabinet labeled "Document Control File" in the Compliance Department and maintained by the Compliance Administrative Assistant.

2. All active projects will be filed in the DCF cabinet. Once a project is concluded the Point of Contact (POC) individual will determine whether the project will remain on site for one year (1yr), three years (3yr) or life of facility (LOF).

3. Periodicals that are ongoing will be the responsibility of the Point of Contact (POC) individual, unless other wise stated. It will be the POC individual's responsibility to update the DCL and the Document ID Summary.

4. Original Permits will be filed in the Permit Document Control File cabinet.

5. Projects/ periodicals can be stored as one year (1yr), three year (3yr), or life of facility (LOF).
    a. <u>One Year (1yr)</u>: **Projects**: will be stored in the Compliance Department. **Periodicals**: will be stored either with the POC individual or in the Compliance Department. See DCL for location of file.

    b. <u>Three Years (3yr) or Life of Facility (LOF)</u>: **Projects/ Periodicals**: may be stored in the Compliance Department or in the on-site Compliance storage trailer. **Periodicals** may also be with the POC individual. See DCL for location of all Files.

        i. It is up to the discretion of the POC individual to determine whether the projects/ periodicals will be stored in the Compliance storage trailer. When files are stored in the Compliance storage trailer they will be stored in File Safe boxes with File Safe storage tracking numbers on them. The Front Desk Receptionist will issue File Safe tracking numbers.

6. **Projects/ Periodicals** requiring off site storage will be boxed in File Safe boxes and given a File Safe storage tracking number. The Front Desk Receptionist will issue File Safe tracking numbers.

    a. <u>Off-Site:</u> All off-site storage will be held at File Safe Record Management, 12 Arrowhead Lane, Cohoes, NY 12047. All tracking numbers will be clearly

indicated in the DCL as will as on the File Safe "Norlite Data Storage Inventory" log located at the Front Desk Receptionist.

NORLITE CORPORATON
Policy Number: XXXXX
Effective Date: XXXX

SOP TITLE

I. PURPOSE

Provide summary identifying the objective of the SOP.

II. SCOPE

Provide area or employees that are to be affected.

III. RESONSIBILITIES

List responsible personnel or departments. May be more than one.

III. PROCEDURES

Provide list of criteria (in order of completion) to be followed for performing particular task.

NORLITE CORPORATON
Policy Number: SSMP 1-03
Effective Date: 9/03

MACT REGULATORY CONTACT AND REPORTING

I. PURPOSE

Provide a basis for the MACT regulatory reporting requirements and whom to report to.

II. SCOPE

LWAK and APC

III. RESONSIBILITIES

Operations and Environmental Management Staff

IV. PROCEDURES

Regulatory Reporting Requirments

1. **Semi-Annual SSM Reports**- sent to the regulatory agencies and includes the following:
   - events that did not follow the SSMP
   - excessive exceedance reports
   - summary report of all times of startup, shutdown or malfunction
2. **Excessive Exceedance Reports**-report is filed with agencies if there are 10 or more exceedances in a 60-day period.
   - Must submit written report of the 10 exceedances within 5 days of the 10^{th} exceedance.
3. **Immediate SSMP Reports**-report must be filed if actions taken during an SSM event are not consistent with SSMP or written SOP's.
   - Must verbally notify the agency within 2 days of event and must follow up with letter with in 7 days.
   - Must update SSMP and/or SOP's that have been deviated from or not been established within 45 days of deviation.

Who to report to: make report to both agencies listed below.

NYSDEC
Attn: Parag Amin
Central Office
625 Broadway
Albany, NY 12233
Tel: (518) 402-8609

USEPA
Attn: Kenneth Eng
Air Compliance Branch-Region 2
290 Broadway
New York, NY 10007-1866
Tel: (212) 637-4069

NORLITE CORPORATON
Policy Number: SSMP 2-01
Effective Date: 9/03

KILN STARTUP PROCEDURE-COLD

I. PURPOSE

Provide a compliant, efficient and safe means of startup for the Lightweight Aggregate Kilns (LWAK) and associated Air Pollution Control Equipment (APC) from a cold* state of operation.

II. SCOPE

LWAK and APC

III. RESONSIBILITIES

Kiln Burner Operators and Kiln Supervisors.

IV. PROCEDURES

1. **Pre-Heat Up.**
   a. Open make-up water to fill recycle tank.
   b. Start recycle pump, establish flow.

2. **Heat-Up: 1st Stage. Cold to 600°F**
   a. Establish air flow to Pilot, Fire eye.
   b. Turn gas/fuel oil pilot switch on.
   c. Ignite pilot.
   d. Turn main gas switch on.
      i. Open/Reset semi-auto Maxon valves.
      ii. Turn main gas on (1-2 lines).
         1. Time frame between Pilot and Main gas may depend on weather and/or maintenance done.
   e. Open LGF vent valve.
   f. Open quench, mist pad and emergency water valves. Start quench pump.
   g. Establish caustic flow.
   h. Start blowdown pump. Establish flow.

   At 200-300°F Backend temperature (mra).
      a. Start ID Fan at 30%.
      b. Increase ID Fan 10-15% and add one (1) line of gas approximately every hour.

   i. Begin rotating kiln on Pony Drive.

* -Cold state of operation is considered as any amount of time exceeding 12 consecutive hours of flame off.

3. Heat-Up: 2nd Stage. 600-1100°F

a. Start Primary Air fan.
b. Continue adding one (1) line of gas and increasing fan 10-15% per hour.
c. Start Heat Exchanger fans.
d. Begin Lime Flow to baghouse.
e. Start front Baron fan.
f. Switch to waste oil, gas off.
g. Switch kiln to main drive for continuous rotation.
h. Start tire/nose ring fans.
i. Start cooler system, conveyor.
j. Start shale conveyors and introduce shale into kiln (12-14 tph) Once back-end temperature is between 1070-1100°F mra.
k. Ensure all MACT/RCRA parameters are in spec, then switch to LGF.
l. Once clinker reaches cooler, turn on cooler fans.

NORLITE CORPORATON
Policy Number: SSMP 2-02
Effective Date: 9/03

KILN STARTUP PROCEDURE-WARM

I. PURPOSE

Provide a compliant, efficient and safe means of startup for the Lightweight Aggregate Kilns (LWAK) and associated Air Pollution Control Equipment (APC) from a warm* state of operation.

II. SCOPE

LWAK and APC.

III. RESPONSIBILITIES

Kiln Burner Operators and Kiln Supervisors.

IV. PROCEDURES

WARM KILN STARTUP will follow the same procedures as COLD KILN STARTUP starting at a minimum of Step 2-e of the COLD KILN STARTUP procedure (SSMP 2-01).

"Depending on nature of repairs and/or length of time kiln has been down, some steps may have been already covered."

1. Re-heat kiln on Gas.
2. Adjust ID fan accordingly.
3. Re-start lime system if not already running.
4. At 600-800°F Back-end Temperature, continue with SSMP 2-01, step 3.

To ensure emissions are minimized, LGF cannot be turned on until kiln Back-end temperature exceeds 1020°F for one minute and shale has been introduced into the barrel.

It will be the operators/supervisors responsibility to determine what step he/she is at in the KILN WARMUP process and follow procedures accordingly.

Different Kiln temperatures will result in starting at different steps of the procedure.

*Warm state of operation is considered as any amount of time less than 12 consecutive hours of flame off.

NORLITE CORPORATON
Policy Number: SSMP 2-03
Effective Date: 9/03

KILN SHUTDOWN-PLANNED/ROUTINE

I. PURPOSE

Provide a compliant, efficient and safe means of a cold shutdown for the Lightweight Aggregate Kilns (LWAK) and associated Air Pollution Control Equipment (APC).

II. SCOPE

LWAK and APC

III. RESPONSIBILITIES

Kiln Burner Operators and Kiln Supervisors.

IV. PROCEDURES

1. Stop shale feed and turn conveyors off.

2. To minimize emissions, LGF flow should be stopped within 25 minutes from the time shale feed was cut-off, turn Low Grade Fuel (LGF) OFF and switch to Fossil Fuel.

3. After kiln is empty:

   a. Close LGF vent valve.
   b. Turn Fire/Pilot OFF.
   c. Close LGF, Oil and Gas Valves.
   d. Place N2 failsafe switch in OFF position.
   e. Turn Gas/Pilot switch OFF.
   f. Turn Lime system OFF for the appropriate kiln.
   g. ID fan will remain ON for cool down of kiln, depending on planned entry time.

4. Continue to run APC equipment.

5. Run cooler until all material is discharged, then SHUTDOWN drive, screens, fans and conveyors and front Barron fan.

6. Turn off kiln drive. The Pony motor may be used to turn the kiln at a slower speed.

7. Shut OFF Heat Exchanger fans.

8. Shut OFF ID fan.

9. Shut Scrubber down:

   a. Turn make-up water OFF.
   b. Turn recycle pump OFF.
   c. Turn caustic flow OFF, feed valves OFF, returns OPEN.
   d. Continue blowdown until tank is EMPTY.

9. KILN rotation may be stopped as needed.

NORLITE CORPORATON
Policy Number: SSMP 2-03A
Effective Date: 9/03

KILN SHUTDOWN-EMERGENCY/UNEXPECTED

I. PURPOSE

Provide a compliant, efficient and safe means of an emergency/unexpected shutdown for the Lightweight Aggregate Kilns (LWAK) and associated Air Pollution Control Equipment (APC).

II. SCOPE

LWAK and APC

III. RESPONSIBILITIES

Kiln Burner Operators and Kiln Supervisors.

IV. PROCEDURES

Emergency/Unexpected kiln shutdown can occur at anytime. In order to minimize emissions, the following procedures should be followed at a minimum, if the situation for the shutdown allows.

1. Stop shale feed to Kiln.
   a. Turn conveyors, rotary valve and accurate feeder off if necessary.

2. LGF or Fossil Fuel may be required to be shutoff immediately. **If not**;

3. LGF flow should be stopped within 25 minutes from the time shale feed was cut-off.
   a. Cut the LGF flow and switch to fossil fuel (used oil or natural gas)

4. After kiln is empty:

   a. Close LGF vent valve.
   b. Flame Out (used oil or gas), Valves closed.
   c. Primary Air fan OFF.
   d. Pilot OFF/Switch OFF
   e. Place N2 failsafe switch in OFF position.
   f. Turn Lime feeder OFF.
      i. If Shutdown does not require ID Fan to be shutdown, Lime rotary valve and blower may continue to run.
   g. ID fan will remain ON for cool down of kiln, depending on planned entry time **OR**;
      i. If entry is not required, ID Fan will remain on at a speed not to exceed maximum amperage.
      ii. If entry is required; (if possible), the slow ramping down of fan speed should be used, so not to cause thermal shock of kiln.

5. Run cooler until all material is discharged, then SHUTDOWN drive, screens, fans and conveyors and front Barron fan.
   a. If entry into cooler is not required, system may continue to run.

6. Continue to run APC equipment.

7. Shutdown both Heat Exchanger fans.
   a. If entry is not required, fans may remain on to aid cool down.

8. Shutdown ID fan.
   a. If entry is not required, fan will remain on.

9. Shutdown Scrubber.
   -If entry is not required, scrubber will remain on (recycle, blowdown, caustic)

   a. Turn make-up water/caustic off.
      i. If shutdown does not require recycle tank to be empty, maintain tank level and caustic flow to ensure pH balanced water to wwtp.
      ii. Otherwise close make-up water valve, close caustic feed valves and open returns.

   b. Turn recycle pump off.
   c. Turn quench pump off.
   d. Close quench, mist pad, emergency water valves.
   e. Turn blowdown pump off, after tank is empty.

10. Kiln rotation may be stopped as needed.

NORLITE CORPORATON
Policy Number: SSMP 2-04
Effective Date: 9/03
Revised: 10/03

MINIMUM KILN BACKEND TEMPERATURE

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for exceeding the span limits or the minimum Kiln Backend Temperature of 866°F.

II. SCOPE

Minimum Kiln Backend Temperature

III. RESPONSIBILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems should be investigated for the Kiln Backend temperature.

1. Check for high Venturi and/or Ducon differential pressure (DP). (refer to SOP SSMP 3-03)

2. Check for high baghouse DP. (refer to SOP SSMP 3-02)

3. Check for loss of ID fan. (refer to SOP SSMP 2-18)

4. To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result decreased kiln backend temperature.

5. Insure instrumentation measuring the Kiln Backend Temperature is operating correctly. Call I&E if there is a problem.

NORLITE CORPORATON
Policy Number: SSMP 2-05
Effective Date: 9/03
Revised: 10/03

MAXIMUM BAGHOUSE INLET TEMPERATURE

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for exceeding the span limits or the maximum Baghouse Inlet Temperature of 400°F.

II. SCOPE

Baghouse Inlet Temperature

III. RESPONSIBILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems should be investigated for the Baghouse Inlet Temperature.

Loss of Heat Exchanger Fan –refer to SOP SSMP 3-01

Loss of ID Fan –refer to SOP SSMP 2-18

Loss of Dilution Damper –refer to SOP SSMP 2-19

Instrumentation - Insure instrumentation measuring the Kiln Backend Temperature is operating correctly. Call I&E if there is a problem.

To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result of the maximum baghouse inlet temperature.

NORLITE CORPORATON
Policy Number: SSMP 2-06
Effective Date: 9/03
Revised: 10/03 8/04

MAXIMUM STACK GAS FLOW RATE

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for exceeding the span limits or the Maximum Stack Gas Flow Rate of 60,000 wscfm.

II. SCOPE

Stack Gas Flow Rate

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems should be investigated for the Stack Gas Flow Rate.

1. Check the following components that could indicate restrictions at baghouse modules.
   a. Baghouse DP-High
   b. Venturi/Ducon DP-High
   c. Heat Exchanger DP-High (tube restrictions)
   d. Fan/Bearing failure

2. If problem persists, flame out/shut down and call I & E to check instrumentation failure.

3. To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result of the maximum stack gas flow rate.

NORLITE CORPORATON
Policy Number: SSMP 2-07
Effective Date: 9/03
Revised: 10/03

MINIMUM VENTURI PRESSURE DROP

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for the Venturi Pressure Drop to exceed the span limits or fall below the minimum of 2.0 inches water column (wc).

II. SCOPE

Venturi Pressure Drop

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems should be investigated for the Venturi Pressure Drop.

1. Loss of ID fan –refer to SOP SSMP 2-18.

2. Baghouse Air Restriction

   a. Adjust pulsers in MCC at PLC panel

   -Turn both black needle dials counter clockwise past red needle. This will lower DP for baghouse. Do this for each module.

   b. If DP does not lower or baghouse is not pulsing, check the following:

      i. Check for air leaks on top of the baghouse at pulsing solenoid by shutting ball valve on leaking solenoid; cleaning of bags will resume.

   c. Check Ducon DP (High DP)

      i. Verify water flow to mist pad.
      ii. Increase flow to mist pad to lower Ducon DP.

   d. Verify operation of Heat Exchanger fans.

   e. Verify operation of Dillution Damper.

   f. Increase ID fan speed. (not to exceed 400 amps)

3. To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result of the minimum venturi pressure drop.

4. Insure instrumentation that measures the pressure drop is operating correctly. Call I&E if problematic.

NORLITE CORPORATON
Policy Number: SSMP 2-08
Effective Date: 9/03
Revised: 10/03

MINIMUM SCRUBBER BLOWDOWN RATE

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for the Scrubber Blowdown Rate to exceed the span limits or fall below the minimum of 13.0 gallons per minute (gpm).

II. SCOPE

Scrubber Blowdown Rate

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems should be investigated for the Scrubber Blowdown Rate.

1. Check for plugged filter basket at blowdown pump.
   a. Clean filter basket if needed.

2. Check for restrictions in piping and/or Worchester valve.
   a. Clean/replace if needed.

3. Check for plugged discharge hose.
   a. Clean/replace if needed.

4. If flowmeter needs to be calibrated, call I & E for cleaning and/or calibration.

5. To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result of the scrubber blowdown rate.

NORLITE CORPORATON
Policy Number: SSMP 2-09
Effective Date: 9/03
Revised: 10/03

MINIMUM SCRUBBER TANK LIQUID LEVEL

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for the Scrubber Tank Liquid Level to exceed the span limits or fall below the 40% minimum tank level.

II. SCOPE

Scrubber Tank

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems should be investigated for the Scrubber Tank Liquid Level decrease.

1. Loss of Make-up Water

   This happens due to the loss of Plant or City water flow. If system is running on Plant water when flow stops, change valves so system will run on City Water. If system is running on city water when flow stops, change valves so system is running on Plant water.

   When plant water flow stops, check the following:

   a. Check clean water tank for water level.
   b. If tank is full, but pump is not running-switch to city water.
      a. Switch to City water-open primary waterline in city water building and close quarry water lines in Kiln 1 Scrubber.
   c. If clean water tank is full and pumps are running and city water flow cannot refill tank, then both Kilns/Scrubbers have to be shutdown.

   When city water flow stops, check the valves in the City water building, if nothing is wrong, then call Kiln supervisor.

2. Restriction at Venturi discharge.

   a. Shutdown kiln/scrubber and clear restriction.

3. Check for blockage at bottom of Ducon.

   a. Close 4" valves at Ducon and return to recycle tank.
   b. Disconnect 4" hose off Ducon tank.
      i. Check hose for clockage.
      ii. Open 4" valve at Ducon and check for flow, clear if necessary.
      iii. If valves do not close, Kiln will have to be shutdown.

4. Check flowmeter, call I&E to clean and/or recalibrate, if needed.

5. To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result of the scrubber tank liquid level.

NORLITE CORPORATON
Policy Number: SSMP 2-10
Effective Date: 9/03
Revised: 10/03

MINIMUM SCRUBBER RECIRCULATION RATE

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for the Scrubber Recirculation Rate to exceed the span limits or fall below the 175 gallons per minute (gpm) minimum.

II. SCOPE

Scrubber Recirculation Rate

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems should be investigated for the Scrubber Recirculation Rate. There are two pumps for the scrubber recirculation, if one fails, switch to alternate and check the bad pump for the following to get it back online.

1. Check for loss of the pump, switch to alternate pump if needed.
2. Check for a loss of the prime.
3. Re-prime if necessary.
4. Check for plugged headers.
5. Replace or clean headers if necessary.
6. Check for a plugged basket on recycle pump.
7. Clean baskets if necessary.
8. If both pumps are online and rate falls below 175 gpm, put Kiln on fossil fuel and insure LGF flow has been automatically shut-off to minimize emissions.

Instrumentation-Insure the instrument that measures scrubber recirculation rate is operating correctly. Call I&E if problematic.

NORLITE CORPORATON
Policy Number: SSMP 2-11
Effective Date: 9/03
Revised: 10/03

MINIMUM SCRUBBER LIQUID pH

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for the Scrubber Liquid pH to exceed span limits or fall below the 1.9 pH minimum.

II. SCOPE

Scrubber Liquid pH

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems should be investigated for the Scrubber Liquid pH.

1. Restricted Flow
   -Check for return flow back into caustic tank in Soda Ash building.

   a. If flow is strong, restriction is in scrubber building.

      i. Close and drain feed/return caustic lines.
      ii. Disconnect piping and clear restriction.

   b. If flow is weak-

      i. Close feed line at its initial starting point at manifold in Soda Ash building .
      ii. Clear restriction in feed line.

2. Failure of Caustic Feed System

   a. Loss of prime on pump.
      i. Re-prime pump.

   b. Pump failure.
      i. Switch to back-up pump.
      ii. Repair old pump.

3. Loss of Soda Ash

   a. Check to make sure feed auger is working.
   b. Turn on vibrators to losen soda ash that has bridged in silo system.

4. Insure instrumentation that measures pH is operating correctly. Call I&E if problematic.

5. To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result scrubber liquid pH.

NORLITE CORPORATON
Policy Number: SSMP 2-12
Effective Date: 9/03
Revised: 10/03

DRY SORBENT (LIME) FEED RATE

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for the Dry Sorbent Feed Rate to exceed the span limits or to fall below the 200 pounds an hour (lbs/hr) minimum.

II. SCOPE

Dry Sorbent Feed Rate

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems should be investigated for the Dry Sorbent Feed Rate.

1. LIME FEEDER STOPPAGE
   a. Switch drive to manual and try to reset.
   b. Diagnose problem.
   c. Switch kiln to back-up feeder while repairs can be made.

2. LIME ROTARYVALVE STOPPAGE
   a. Manually try to restart valve.
   b. Switch kiln to back-up feeder while repairs can be made.

3. BLOWERS: 4 TOTAL, 2 BACK-UP
   a. Check motor/drive belts are operational.
   b. Manually try to re-start
   c. Switch kiln to back-up blower.
   d. Insure instrumentation is operational.
   e. Disassemble piping to check for restrictions.

4. INSTRUMENTATION-Insure instrumentation that measures lime feed rate is operating correctly. Call I&E if problematic.

To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result of the dry sorbent feed rate.

NORLITE CORPORATON
Policy Number: SSMP 2-13
Effective Date: 9/03

MINIMUM DRY SORBENT (LIME) CARRIER FLUID FLOW RATE

Revised: 10/03

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for the Dry Sorbent (Lime) Carrier Fluid Flow Rate to exceed the span limits or fall below the 150 cubic feet per minute (cfm) minimum.

II. SCOPE

Dry Sorbent Carrier Fluid Flow Rate

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems should be investigated for the Dry Sorbent Carrier Fluid Flow Rate.

1. Refer to SOP SSMP 2-12 for procedures on the blowers.

2. Insure instrumentation that measures lime flow rate is operating correctly. Call I&E if problematic.

3. To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result of the dry sorbent carrier fluid flow rate.

NORLITE CORPORATON
Policy Number: SSMP 2-14
Effective Date: 9/03
Revised: 10/03

KILN PRESSURE

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for the Kiln Pressure to exceed the span limits or rise above the standard of 0.00 water gauge (wg).

II. SCOPE

Kiln Pressure

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems be investigated for the Kiln Pressure.

1. Verify coller discharge doors are clear of excess aggregate.
2. Verify operation of ID/Front Barron fan.
3. Increase ID/Baron fan, if possible.
4. Adjust BHDP down, if possible. (SSMP 3-02).
5. Check Venturi/Ducon D.P.
6. Verify operations of Heat Exchanger fans/Dilution Damper.
7. Unstable Fuel Flow/Unstable Fire.
   a. Increase ID Fan, if possible.
   b. Decrease cooler fan(s).
8. To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result negative kiln pressure no longer being negative.

NORLITE CORPORATON
Policy Number: SSMP 2-15
Effective Date: 9/03

HIGH CARBON MONOXIDE

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for the condition of High Carbon Monoxide.

II. SCOPE

High Carbon Monoxide

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems should be investigated should the Carbon Monoxide emissions increase towards the WFCO limit of 100 parts per million (ppm), on a one minute average.

1. Loss of Pilot.

   a. Reset semi-auto Maxon valve.
   b. Start/depress pilot until flame has ignited.
   c. Add fossil fuel until CO hourly rolling average (hra) is within the limits.
   d. Switch to LGF.

2. Unstable Fuel.

   a. Switch to fossil fuel if CO is greater then 75 ppm hra.
   b. Wait until CO is below 75 ppm hra before switching back to LGF.

   The limit for CO varies for each type of fuel.

   CO alarm limits: LGF-75 ppm hra
   Kiln Oil- 500 ppm hra
   Natural Gas-none

3. Insure instrumentation that measures CO is operating correctly. Call I&E if problematic.

4. To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result high CO.

NORLITE CORPORATON
Policy Number: SSMP 2-16
Effective Date: 9/03
Revision Date: 8/04

MINIMUM LGF ATOMIZATION AIR PRESSURE

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for the condition of Minimum Atomization Air Pressure.

II. SCOPE

Minimum Atomization Air Pressure

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems should be investigated should the Minimum Atomization Air Pressure reach a level of 52 psig.

1. Check to see if main air compressor is running.

If Not Running:

- Restart Compressor;
- If No restart, connect portable air compressor to main feed lines.

If Running:

- Check for leaks in air system;
- Call I&E for calibration of instrument

2. To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result of the minimum atomization air pressure.

NORLITE CORPORATON
Policy Number: SSMP 2-17
Effective Date: 9/03
Revised: 10/03

POWER FAILURE

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for a Power Failure.

II. SCOPE

Power Failure-Loss of Operations

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

The following procedures should be followed in the event of a loss of power.

1. Total Power Loss (Operations)

    a. Electrically disconnect kiln(s)
    b. Couple kiln(s) to Pony Drive.
    c. Start Pony Drive and begin to turn kiln(s).

2. Total Power Loss (Kiln Operator-Burner)

    a. Close LGF vent valve(s).
    b. Manually close all LGF and waste oil valves.
    c. Close water supply valve to burner.
    d. Close Gas/Pilot valves to "Off" position.

3. Sporadic Power Loss

    a. Identify equipment that has been affected.
    b. Try to restart equipment.
        i. If equipment does not restart, processes may need to be shut down, (i.e. fire/shale) as not to cause damage.

4. Restart/Re-energize by list of importance (if not already running)

    a. Recycle pump, quench pump, blowdown pump and clean water pump at WWTP.
    b. ID fan.
    c. Kiln drive.
    d. Heat exchanger fans.
    e. Re-light fire.
    f. Soda ash pump/mixers.
    g. Cooler fans, drive, screws, front barron fan.
    h. Clinker conveyor.
    i. Lime system.
    j. APC equipment.
    k. Shale conveyors.
    l. LGF/Waste oil pump on at Fuel Farm.
    m. Shale on after kiln has been re-heated.
    n. LGF on, after all parameters are in compliance.

LOSS OF ID FAN

I. PURPOSE

Provide a procedure to restart the Induced Draft (ID) Fan in case of loss or span limit exceedance.

II. SCOPE

ID Fan

III. RESPONSIBILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems should be investigated should the ID Fan exceed span limits or exceed 405 amperes.

1. Re-start Fan.

2. If fan will not restart, open dilution damper to 100%, then call I & E to diagnose the problem.

3. To assure that emissions are minimized during this procedure, insure that LGF flow has been automatically discontinued as a result of the ID fan exceeding 405 amperes.

4. Insure the instrument that measures ID fan amps is operating correctly. Call I&E if problematic.

I. PURPOSE

Provide a procedure to investigate the loss of the Dilution Damper.

II. SCOPE

Dilution Damper

III. RESPONSIBILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

1. Adjust Heat Exchanger fans.
2. If not possible-manually adjust damper by disconnecting control arm.
3. Lower ID fan.
4. If none of the above remedy situation, Flame out/Shut down until repairs are completed.
5. Insure instrumentation that measures dilution damper is operating correctly. Call I&E if problematic.

To assure that emissions are minimized during this procedure, insure that LGF flow has been automatically discontinued as a result of the dilution damper.

NORLITE CORPORATON
Policy Number: SSMP 2-20
Effective Date: 9/03
Revised: 10/03

LOSS OF LGF FLOW

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for the LGF Flow to exceed span limits or be lost.

II. SCOPE

LGF Flow

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following steps should be taken for the flow of LGF.

LGF Line

1. Manually open/close LGF valves.
2. Close OPCO/WFCO valve then used piped in water to flush lines.
3. Take apart and check for obstruction

Loss of flow from Pump/Low Pressure

1. Check tank screen to see if pump is running. Restart/Reprime pump.
2. Close down on recirculation valve in EQ room to increase pressure.

Instrumentation

1. Insure the instrument that measures LGF flow is working correctly. Contact I&E is problematic.

NORLITE CORPORATON
Policy Number: SSMP 2-21
Effective Date: 9/03
Revised: 10/03

LOSS OF SHALE FEED

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for the Loss of Shale Feed or span limit exceedance.

II. SCOPE

Shale Feed

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following steps should be taken for the Shale Feed.

The possible reasons for the loss of shale feed are: stoppage of belts, stoppage/loss of rotary valve or stoppage of feed from silo.

1. Stoppage of Belts.
   a. Identify problem, make repairs and then go back on line.
   b. To minimized emissions, if repairs are not made within 25 minutes, kiln operator must go OFF of LGF until shale can be reintroduced into kiln.
2. Stoppage or Loss of Rotary Valve
   a. Check for blockage of chute into kiln.
   b. If chute is plugged, manually clean out.
   c. Check to make sure rotary valve is functional.
   d. To minimized emissions, if repairs are not made within 25 minutes, kiln operator must go OFF of LGF until shale can be reintroduced into kiln.
3. Stoppage of Feed from Silo
   a. Check for large stones or frozen material blocking chute from silo.
   b. If blocked, chute must be cleaned and freed of blockage.
   c. To minimized emissions, if repairs are not made within 25 minutes, kiln operator must go OFF of LGF until shale can be reintroduced into kiln.

Instrumentation-Insure instrument that monitors shale feed is working correctly. Call I&E if problematic.

NORLITE CORPORATON
Policy Number: SSMP 2-22
Effective Date: 8/04

MINIMUM LIQUID TO GAS RATIO (L/G)

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for the minimum liquid to gas ratio to fall below the minimum limit of 4.0 gallons/1000 wet scfm.

II. SCOPE

Minimum Liquid to Gas Ratio

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following steps should be taken for the liquid to gas ratio.

1) Check for low recycle flow;

2) Check for low gas flow rate and/or check ID fan settings.

3) Call I&E.

To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result of the liquid to gas ratio.

NORLITE CORPORATON
Policy Number: SSMP 2-23
Effective Date: 8/04

MAXIMUM HEAT EXCHANGER EXIT TEMPERATURE

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for exceeding the span limits or the maximum Baghouse Inlet Temperature of 400°F.

II. SCOPE

Heat Exchanger Exit Temperature

III. RESPONSIBILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To ensure that emissions are minimized, the following systems should be investigated should the Maximum Heat Exchanger Exit Temperature (hra) exceed 453°F.

1) If possible, increase fan speed of Heat Exchanger fans as needed.

2) Check to see if both Heat Exchanger fans are operational.

3) Insure instrumentation of Heat Exchanger Exit Temperature is operational, Call I&E.

To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result of the maximum heat exchanger exit temperature.

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for a malfunction of the Heat Exchangers.

II. SCOPE

Heat Exchangers

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

In order to minimize emissions, the following systems should be investigated should there be a malfunction of the Heat Exchangers.

1. Check Heat Exchanger drive for root cause (belts, motors, etc…..).
2. If OK, restart fan.
3. If unable to restart fan, use dilution damper to lower inlet temperature.
4. It is possible to run kiln on one fan.
5. Evaluate air flow thru tubes in Heat Exchanger. If a large number of tubes have restricted flow, the heat exchanger needs to be cleaned.
6. Total loss of both fans.
    a. Lower ID fan.
    b. Increase Barron fan.
    c. Kiln flameout/shutdown until repairs are made.
7. Call I & E to diagnose problem and to check instrumentation.
8. To assure that emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result of loss of heat exchangers.

NORLITE CORPORATON
Policy Number: SSMP 3-02
Effective Date: 9/03

BAGHOUSE MALFUNCTION

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for a malfunction of the Baghouses.

II. SCOPE

Baghouses

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

In order to minimize emissions, the following systems should be investigated should there be malfunction of the Baghouses.

1. **Bag Leak Detection Alarm activated** in burner control room. **NOTE: Must initiate procedures used to determine cause of alarm w/in 30 minutes of the time alarm first sounds.**

   a. Notify Trunnion operator of alarm.
   b. Initiate completion of SSMP 3-04A-Operators Checklist

   The following may be necessary to alleviate the cause of the alarm.
   a. Inspect baghouse for air leaks, torn or broken filter elements or other malfunctions
   b. Seal off defective baghouse
   c. Clean the bag leak detection probe, or otherwise repairing the bag leak detection system. (Contact I&E)
   d. Shut down kiln.
   e. Refer to SOP **OM 2-03** for procedure for bag replacement.

2. **High or Low Baghouse Differential Pressure (BHDP)**
   (referenced with low venturi pressure)

   a. High BHDP
      i. Adjust needles on magnahelic indicators (in MCC) to lower DP-both red needles turned counter clockwise past black needle

      OR

      ii. Check for leaks at ASCO valves on top of baghouse.
      iii. Check air to pulsers (65-70 psi minimum).
      iv. Check/clean overall DP sample lines in baghouse duct work.

   b. Low BHDP

      i. Adjust needles on magnahelic in MCC room. Turn dials clockwise so both red needles go past black needle. This will stop pulsing of baghouse to increase DP.

NORLITE CORPORATON
Policy Number: SSMP 3-03
Effective Date: 9/03
Revised: 10/03

DUCON AND VENTURI SCRUBBERS

I. PURPOSE

Provide a procedure to investigate the possible reason(s) for a malfunction of the Ducon and Venturi Scrubbers.

II. SCOPE

Ducon and Venturi Scrubbers

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

To minimize emissions, the following systems should be investigated should there be malfunction of the Ducon and Venturi Scrubbers.

1. Ducon Scrubber Malfunction

    a. High DP Across Ducon Scrubber
        i. Loss/Reduction of flue gases thru scrubber
            1. Shutdown Kiln to inspect/clean.

2. High DP across Venturi

    a. Loss/Reduction of flue gases thru Venturi.
        i. Increase Quench water flow to clear.

3. Failure of Scrubbers

    a. Shutdown Kiln to insect/clean.

4. Insure instrumentation that measures scrubbers is operating correctly. Call I&E if problematic.

5. To assure emissions are minimized during this procedure, insure that LFG flow has been automatically discontinued as a result of scrubber pressure drop.

MACT FIELD OPERATORS CHECKLIST

I. PURPOSE

Provide a checklist to ensure Kiln(s), Air Pollution Control Equipment and Monitoring Equipment are operated within parameters of MACT Plans.

II. SCOPE

Kiln(s), Air Pollution Control Equipment and Monitoring Equipment

III. RESPONSIBIILITIES

Kiln Burner Operators, Kiln Supervisors or Instrumentation and Electrical Department (I & E)

IV. PROCEDURES

Refer to SSMP 3-04A for checklist form.

1. Kiln Operators, Supervisors or the I & E department are to fill out the checklist each time there is a startup, shutdown or malfunction of the kilns, air pollution control equipment or monitoring equipment.

MACT Startup, Shutdown and Malfunction Plan
Kiln Burner Operator's Checklist During S, S and M.

This form is to be filled out during a Startup, Shutdown or Malfunction of the Kiln, Air Pollution Control (APC), Monitoring Equipment or a Bag Leak Alarm.

Date: _____ Person Completing Form: _____ Shift: _____

Circle Event: (Required) Startup Shutdown Malfunction Bag Leak Alarm
NOTE:(Must start procedures to decide cause of alarm w/in 30 minutes of time alarm first sounds.)

Circle Event: (Required) APC Monitoring Equipment Kiln 1 Kiln 2

Explain Occurrence: _____

Startup/Shutdown Times

Time System Went Off-Line: _____
(Off All Fuels)
Time System Came On-Line: _____
(Any Fuels On (Start of Procedures), Time is from DEC Report)

Bag Leak Detection Alarm

Time Alarm Activated: _____
Time Corrective Measures began: _____

Malfunction Times

Time Event Occurred: _____
(Time is from Alarm Report)
Time Event Corrected: _____

Office Use Only
Check box if deviated from Plan: ☐

Operator should initial by which SOP's were followed.

SOP #	Description	Operator's Initials
Operations:	**Startup**	
SSMP 2-01	Kiln Startup-Cold	
SSMP 2-02	Kiln Startup-Warm	
	Shutdown	
SSMP 2-03	Kiln Shutdown-Planned	
SSMP 2-03A	Kiln Shutdown-Emergency or Unexpected	
SSMP 2-17	Power Failure	
Continuous Monitoring Systems (CMS):		
SSMP 4-01	Startup	
SSMP 4-02	Power Failure	
SSMP 4-03	Malfunction	
SSMP 4-04	Shutdown	

Malfunctions

List any corrective measures that were done to correct malfunction: _____

Record other actions taken not in SOP's: _____

Key:

Malfunction: any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a rocess to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

Shutdown: the stoppage of operation of an affected source or portion of an affected source for any purpose.

Startup: the setting in operation of an affected source or portion of an affected source for any purpose.

NORLITE CORPORATON
Policy Number: SSMP 4-01
Effective Date: 9/03

CONTINUOUS EMISSIONS MONITORING SYSTEM-STARTUP

I. PURPOSE

Provide a procedure for the startup of the Continuous Emissions Monitoring System (CEMS).

II. SCOPE

Continuous Emissions Monitoring Systems

III. RESPONSIBIILITIES

Instrumentation and Electrical Personnel (I & E)

IV. PROCEDURES

Refer to the **CISCO Operations and Maintenance Manual, dated December 1995, Section 3: SYSTEM START-UP/CHECKOUT.**

NORLITE CORPORATON
Policy Number: SSMP 4-02
Effective Date: 9/03

CONTINUOUS EMISSIONS MONITORING SYSTEM - POWER FAILURE

I. PURPOSE

Provide a procedure for a power failure of the Continuous Emissions Monitoring System (CEMS).

II. SCOPE

Continuous Emissions Monitoring Systems

III. RESPONSIBIILITIES

Instrumentation and Electrical Personnel (I & E)

IV. PROCEDURES

The CEMS is connected to an Uninterrupted Power Source (UPS) battery backup which is capable of operating the CEMS system for approximately 30 minutes after a power failure.

All CEMS data will be backed up while the UPS is operating. Any extended power failure (exceeding 30 minutes) affecting the CEMS would also affect the kilns and associated air pollution control equipment, therefore, no emission would be generated due to the kilns being shutdown for longer than 30 minutes.

To restart CEMS, refer CISCO Operations and Maintenance Manual, Dated 1995, Section 3

NORLITE CORPORATON
Policy Number: SSMP 4-03
Effective Date: 9/03

CONTINUOUS EMISSIONS MONITORING SYSTEM-MALFUNCTION

I. PURPOSE

Provide a procedure to follow during a malfunction of the Continuous Emissions Monitoring System (CEMS).

II. SCOPE

Continuous Emissions Monitoring Systems

III. RESPONSIBIILITIES

Instrumentation and Electrical Personnel (I & E)

IV. PROCEDURES

"Faulty CEM" light starts to flash in control room.

1. Switch to gas or oil (if approved to burn as virgin fuel).
2. Notify Supervisor
3. Contact I&E.
4. Wait for supervisor's approval to begin burning waste fuel.

I. PURPOSE

Provide a procedure to follow during the shutdown of the Continuous Emissions Monitoring System (CEMS).

II. SCOPE

Continuous Emissions Monitoring Systems

III. RESPONSIBIILITIES

Instrumentation and Electrical Personnel (I & E)

IV. PROCEDURES

The CEMS is on-line continuously, for 24 hours a day, 7 days a week and 365 days a year.

The only exception is when an upgrade to the PCL and DAS is required. The kiln and all associated air pollution control equipment would also be shut down before the CEMS was placed off-line.

NORLITE CORPORATON
Policy Number: OM 2-02
Effective Date: 9/03

TANK SWITCH-AFTER HOURS

I. PURPOSE

Provide a method for proper lockout of LGF storage tanks in the Fuel Farm during the hours when Fuel Farm employees are ***not blending or unloading LGF***, so as to avoid the inadvertent introduction of incompletely blended LGF into the kiln burner system.

II. SCOPE

Fuel Farm

III. RESPONSIBIILITIES

Kiln Supervisor

IV. PROCEDURES

With the exception of the current burn tank, all tanks capable of being put on the LGF raceway (burn tanks) will be locked out during non-blending or unloading hours, typically nights and weekends.

A. Responsibilities

1. Fuel Farm personnel will be required to lock out all LGF burn tanks on a daily basis at the end of blending and unloading operations, with the exception of the in process burn tank. The employee performing lockout activities will sign off that lockouts were completed on the daily Unloading/Transfer sheet.

2. Lab personnel will be responsible for performing a visual check verifying that all LGF tanks are properly locked out, with the exception of the burn tank. The visual check will be performed any day that a Shift Supervisor Burn Log sheet is issued. The tank status will be noted on the burn instructions to the kiln operators/shift supervisors.

3. The kiln supervisor is responsible for switching burn tanks according to the procedures set forth in Section B below.

B. Tank Switching/Lockout Procedures

Each burn tank will have its own dedicated lockout box with three (3) keyed-alike dedicated locks.

1. Before a burn tank switch is performed, the kiln operator(s) will switch to non-LGF fuel (i.e. oil).

2. The pump for the empty burn tank will be shut down and the bottom suction line valve, the top suction line valve, and the raceway return line valve will be closed and locked out with the dedicated locks from the appropriate lockout box.

3. The next burn tank's valves, top or bottom suction valve and the raceway return valve, will be unlocked and opened to the kiln. The locks will be returned to the appropriate dedicated lockout box.

4. The pump for the new burn tank will be started and flow to the kiln(s) will be established.

5. Within fifteen (15) minutes after LGF flow has been established to the kiln(s) after a tank switch, the kiln supervisor will verify that the tank switch was performed correctly. This will be accomplished by checking level gauges, the safety vent overflow line, and the alarm log on the LGF panel screen for rupture disc failures. During this 15-minute interval, the kiln supervisor will perform a walk through of the entire fenced in area of the Fuel Farm. This will be documented as part of the security rounds on the Security Check sheet.

6. An incident report will be completed by a responsible party as outlined in Section A any time there are less than 3 burn tanks locked as described in these procedures.

NORLITE CORPORATON
Policy Number: OM 2-03
Effective Date: 9/03

BAGHOUSE-BAG CHANGING

I. PURPOSE

Provide a procedure for the correct change-out of the bags in the baghouses.

II. SCOPE

Baghouses

III. RESPONSIBIILITIES

Kiln Maintenance Worker

IV. PROCEDURES

After it has been identified there is a bad bag in the baghouse, follow the following steps for changing the bag(s) out:

1. Kiln goes to gas for a minimum of 30 minutes.
2. Close Inlet and Outlet Dampers.
3. Open Baghouse Door, follow proper entry procedures.
4. Enter Baghouse.
5. Identify a bad bag and/or also check the bag leak detection system.
6. If bad bag proceed to Step 7, if no bad bags, call I & E to investigate bag leak detection system.
7. Pull blow tube.
8. Pull cage and bag.
9. Separate the bag from the cage.
10. Replace bag.
11. Notify Kiln Control of bag replacement.

NORLITE CORPORATON
Policy Number: OM 2-04
Effective Date: 9/03

LWAK, MULTICLONE, AIR TO AIR HEAT EXCHANGER, VENTURI SCRUBBER, MIST ELIMINATOR, ID AND FD FANS

I. PURPOSE

Provide a procedure that ensures the inspections and monitoring of the operating systems located in "SCOPE" .

II. SCOPE

Lightweight Aggregate Kilns (LWAK), Air to Air Heat Exchanger, Venturi Scrubber, Mist Eliminator, ID and FD Fans.

III. RESPONSIBIILITIES

Kiln Burner Operators and Kiln Supervisors

IV. PROCEDURES

The operating procedures for the systems listed in the "SCOPE" consist of multiple daily physical inspections, instead of a detailed step-by-step operational procedure. Each system is continually monitored to ensure it is within in the operational ranges. Below is a description of the inspections that occur at each area.

LWAK

The LWAK is made up of multiple systems. The Kiln Burner Operator is responsible for continually monitoring the LWAK system and the Kiln Shift Supervisor and Trunnion Operator will conduct a daily physical inspection of the system. The inspection sheets that are used to monitor the LWAK system are Attachments OM 2-04A and OM 2-04B.

MULTICLONE

The Wastewater Treatment Shift Operator is responsible for inspecting the Multiclone. The operator uses the inspection sheet, OM 2-04C, to record the results of the inspection.

AIR TO AIR HEAT EXCHANGER

The Trunnion Operator is responsible for inspecting the Air to Air Heat Exchanger. The operator uses the inspection sheet, OM 2-04A, to record the results of the inspection.

VENTURI SCRUBBER

The Trunnion Operator is responsible for inspecting the Venturi Scrubber. The operator uses the inspection sheet, OM 2-04A, to record the results of the inspection.

MIST ELIMINATOR

The Trunnion Operator is responsible for inspecting the Mist Eliminator. The operator uses the inspection sheet, OM 2-04A, to record the results of the inspection.

ID AND FD FANS

The Kiln Burner Operator is responsible for continually monitoring the ID and FD fans system and the Kiln Shift Supervisor and Trunnion Operator conduct random visual inspections of the system.

Insure instrumentation that measures the above mentioned machinery is operating correctly. Call I&E if problematic.

KILN FIELD OPERATORS SHIFT REPORT

NAME_____ DATE_____ SHIFT_____

SUPERVISORS SIGNATURE:_____

WATER READINGS AND SILO LEVELS

QUARRY/CITY WATER READINGS	START	END	GALLONS
KILN1 QUARRY/CITY WATER TOTALIZER			
KILN 1 CAUSTIC TOTALIZER			
KILN 2 QUARRY/CITY WATER TOTALIZER			
KILN 2 CAUSTIC TOTALIZER			
SODA ASH MAKE-UP TOTALIZER			
LIME SILO LEVEL	TIME		
SODA ASH SILO LELEL	TIME		

KILN 1	OIL LEVEL OK	AMOUNT ADDED	SEAL OK
PIER 1 NE			
PIER 1 SE			
PIER 1 NW			
PIER 1 SW			
PIER 2 NE			
PIER 2 SE			
PIER 2 NW			
PIER 2 SW			

KILN 2	OIL LEVEL OK	AMOUNT ADDED	SEAL OK
PIER 1 NE			
PIER 1 SE			
PIER 1 NW			
PIER 1 SW			
PIER 2 NE			
PIER 2 SE			
PIER 2 NW			
PIER 2 SW			
PIER 3 NE			
PIER 3 SE			
PIER 3 NW			
PIER 3 SW			

NOTE PIER 1 IS DISCHARGE PIER

DO OIL DRUMS NEED TO BE EMPTIED AT KILN 2?	PIER 1	PIER 2	PIER 3
KILN 1 PIERS CLEAN			
KILN 2 PIERS CLEAN			
KILN 1 TRUNNION DRIP TRAYS CLEAN			
KILN 2 TRUNNION DRIP TRAYS CLEAN			

BULL GEAR, PINION GEAR AND DUST SEAL INSPECTIONS

	KILN 1	KILN 2	
KILN 1 BULL GEAR GREASED AND KILN 2 OIL LEVEL KILN 2 OIL LEVEL CHECKED			WAS OIL ADDED TO KILN2 GEAR
PINION BEARINGS (EAST AND WEST) GREASED			
# OF FEED SEALS MISSING			
# OF DISCHARGE SEALS MISSING			
KILN 1 ANY MAINTENANCE REQUIRED IN THIS AREA			
KILN 2 ANY MAINTENANCE REQUIRED IN THIS AREA			

LIME FEEDERS, ROTARY VALVES AND BLOWER INSPECTION- RECORD ALL CHANGES

*USE ADDITIONAL SHEETS AS REQUIRED

FEEDING KILN	TIME	SETTING *NOT FROM WAP 2- ACTUAL SETTING*	LIME FEEDER	ROTARY VALVE	BLOWER SELECTED
KILN 1		________lbs./hr	1 2 3	ON OFF	A B C D
KILN 2		________lbs./hr	1 2 3	ON OFF	A B C D
KILN 1		________lbs./hr	1 2 3	ON OFF	A B C D
KILN 2		________lbs./hr	1 2 3	ON OFF	A B C D
KILN 1		________lbs./hr	1 2 3	ON OFF	A B C D
KILN 2		________lbs./hr	1 2 3	ON OFF	A B C D
KILN 1		________lbs./hr	1 2 3	ON OFF	A B C D
KILN 2		________lbs./hr	1 2 3	ON OFF	A B C D

ARE ALL LIME FEEDERS GUARDED- REPORT CONDITION
IS LIME SILO CLEAN AND FREE OF SPENT LIME- REPORT CONDITION

IS ANY MAINTENANCE REQUIRED IN THIS AREA

NAME:_____ DATE:_____ SHIFT:_____

SCRUBBER SYSTEM INSPECTION

	KILN 1	KILN 2
RECYCLE PUMP RUNNING	NORTH OR SOUTH	NORTH OR SOUTH
RECYCLE PUMP LEAKING	YES OR NO	YES OR NO
BLOWDOWN PUMP LEAKING	YES OR NO	YES OR NO

KILN 1 QUENCH WATER SETTINGS	1	2	3	4
KILN 1 MIST PAD WATER SETTING		*NOTE-READINGS TO BE TAKEN AT CENTER OF FLOAT TOTAL QUENCH FLOW SHOULD BE 8 TO 10 GPM		
KILN 2 QUENCH WATER SETTINGS	1	2	3	4
KILN 2 MIST PAD WATER SETTINGS				

KILN 1 QUENCH PUMP RUNNING	YES OR NO	KILN 1 EMERGENCY QUENCH VALVES OPEN	YES OR NO
KILN 2 QUENCH PUMP RUNNING	YES OR NO	KILN 2 EMERGENCY QUENCH VALVES OPEN	YES OR NO
KILN 1 SCRUBBER- IS ANY MAINTENANCE REQUIRED IN THIS AREA?			
ILN 2 SCRUBBER- IS ANY MAINTENANCE REQUIRED IN THIS AREA?			

SODA ASH BUILDING

		KILN 1	KILN 2	TIME	CONCENTRATION
NORTH PUMP FEEDING KILN IS PUMP LEAKING	YES NO				
SOUTH PUMP FEEDING KILN IS PUMP LEAKING	YES NO				
SODA ASH SCREW-REPORT CONDITION ARE ALL COVERS IN PLACE ARE ALL GUARDS IN PLACE	 YES NO YES NO				
SODA ASH MIXERS RUNNING- REPORT CONDITION					
IS ANY MAINTENANCE REQUIRED IN THIS AREA					

HEAT EXCHANGER FANS, PRIMARY AIR FANS, KILN 2 DRIVE AND SILO HEAT INSPECTION

KILN 1 UPPER HEAT EXCHANGER FAN GREASED	YES NO	KILN 1 LOWER HEAT EXCHANGER FAN GREASED	YES NO
KILN 2 HEAT EXCHANGER FAN GREASED	YES NO	KILN 1 LOWER (OLD) FAN RUNNING	YES NO
KILN 1 UPPER(NEW) FAN SETPOINT	HZ	KILN 2 MAIN DRIVE SETPOINT	HZ

KILN 2 HEAT EXCHANGER SETPOINT	HZ	K1 SHALE SILO HEAT RUNNING	YES NO
KILN 1 PRIMARY AIR FAN SETPOINT	HZ	IS ANY MAINTENANCE REQUIRED IN THESE AREAS?	
KILN 2 PRIMARY AIR FAN SETPOINT	HZ		

NAME:_____ DATE:_____ SHIFT:_____

RAW SHALE BELTS INSPECTION

	KILN 1 TOP	KILN 1 BOTTOM	KILN 2 TOP	KILN 2 MIDDLE	KILN 2 BOTTOM
SHALE BELTS AND SPLICES IN WORKING CONDITION	YES NO	YES NO	YES NO	YES NO	YES NO
ROLLERS AND RETURNS IN WORKING CONTITION	YES NO	YES NO	YES NO	YES NO	YES NO
WIPERS IN PLACE AND IN GOOD CONDITION	YES NO	YES NO	YES NO	YES NO	YES NO
HEAD PULLEYS AND TAIL PULLEYS GREASED	YES NO	YES NO	YES NO	YES NO	YES NO
KILN 1 ALL CONVEYOR COVERS AND GUARDS IN PLACE	YES NO	YES NO	YES NO	YES NO	YES NO
KILN 2 ALL CONVEYOR COVERS AND GUARDS IN PLACE			YES NO	YES NO	YES NO

ROTARY VALVE- SHALE FEED FOR KILN 1 REPORT CONDITION	ARE GUARDS IN PLACE	YES NO
ROTARY VALVE- SHALE FEED FOR KILN 2 REPORT CONDITION	ARE GUARDS IN PLACE	YES NO
ACCURATE FEEDER FOR KILN 1 REPORT CONDITION	ARE GUARDS IN PLACE	YES NO
ACCDURATE FEEDER FOR KILN 2 REPORT CONDITION	ARE GUARDS IN PLACE	YES NO
KILN 1 SHALE FEED- IS ANY MAINTENANCE REQUIRED IN THIS AREA		
KILN 2 SHALE FEED- IS ANY MAINTENANCE REQUIRED IN THIS AREA		

COOLER SYSYTEM AND COOLER FAN INSPECTION

COOLERS AND COOLER FANS	KILN 1	KILN 2
COOLER DRIVE SYSTEM GREASED	YES NO	YES NO
BARRON EXHAUST SYSTEM GREASED	YES NO	YES NO
EAST COOLER FAN GREASED	YES NO	YES NO
WEST COOLER FAN GREASED	YES NO	YES NO
KILN COOLER AREAS CLEANED	YES NO	YES NO
COOLER SCREWS RUNNING NORTH	YES NO	YES NO

COOLER SCREW RUNNING SOUTH	YES NO	YES NO
DUST DRUMS EMPTIED	YES NO	YES NO
KILN 1 COOLER- IS ANY MAINTENANCE REQUIRED IN THIS AREA		
KILN 2 COOLER- IS ANY MAINTENANCE REQUIRED IN THIS AREA		

NAME:_____ DATE:_____ SHIFT:_____

CLINKER BELTS AND TUNNEL INSPECTION

		KILN 1	KILN 2
BELTS AND SPLICES IN GOOD CONDITION	YES NO	YES NO	
HEAD PULLEYS AND TAIL PULLEYS GREASED AND GUARDED	YES NO	YES NO	
ROLLERS AND RETURN IN GOOD CONDITION AND GUARDED	YES NO	YES NO	
WIPERS IN PLACE AND IN GOOD CONDITION	YES NO	YES NO	
PUMP IN TUNNEL IN GOOD CONDITION	YES NO	YES NO	
WAS PUMP CHANGED OUT ON YOUR SHIFT	YES NO	YES NO	
CLINKER BELT WATER SPRAYS	ON OFF	ON OFF	
CLINKER BELT HEAD BOX WATER SPRAYS	ON OFF	ON OFF	
TUNNEL CLEAN AT START OF SHIFT	YES NO	YES NO	
TUNNEL CLEAN AT END OF SHIFT	YES NO	YES NO	
ALL CONVEYOR COVERS IN PLACE	YES NO	YES NO	
KILN 1 – ANY MAINTENANCE REQUIRED IN THIS AREA			
KILN 2- ANY MAINTENANCE REQUIRED IN THIS AREA			

AIR COMPRESSORS AND PORTABLE AIR COMPRESSORS

	KILN 1	KILN 2
OIL LEVEL CHECKED	YES NO	YES NO
HOW MUCH OIL WAS ADDED		
AIR COMPRESSOR TEMP		
AIR DRYERS AND AFTERCOOLERS WORKING	YES NO	YES NO

DRYER RELIEF VALVE WORKING PROPERLY	YES NO	YES NO
PORTABLE COMPRESSOR RUNNING	YES NO	YES NO
FLUIDS CHECKED IN PORTABLE	YES NO	YES NO
PORTABLE RE-FUELED FOR NEXT SHIFT	YES NO	YES NO
ANY MAINTENANCE REQUIRED IN THIS AREA		

NAME:_____ DATE:_____ SHIFT:_____

SUPERVISOR DAILY KILN INSPECTION

INSPECTIONS TO BE DONE TWICE A SHIFT *KILN # 1*

DATE _____ **TIME** _____ **OUTSIDE TEMP** _____ **Supv. Init.** _____

Thrust Button Contact Uphill_____ Sec. Down Hill _____ Sec.

Thrust Button Housing Temp Uphill_____ Down Hill _____

Feed Pier Temperature SE _____ NE _____ SW _____ NW _____

Discharge Pier Temperature SE _____ NE _____ SW _____ NW _____

Shell Condition _____

Comments _____

_____

_____

INSPECTIONS TO BE DONE TWICE A SHIFT *KILN # 1*

DATE _____ **TIME** _____ **OUTSIDE TEMP** _____ **Supv. Init.** _____

Thrust Button Contact Uphill_____ Sec. Down Hill _____ Sec.

Thrust Button Housing Temp Uphill_____ Down Hill _____

Feed Pier Temperature SE _____ NE _____ SW _____ NW _____

Discharge Pier Temperature SE _____ NE _____ SW _____ NW _____

Shell Condition _____

Comments _____

_____

_____

SUPERVISOR DAILY KILN INSPECTION

INSPECTIONS TO BE DONE TWICE A SHIFT *KILN # 2*

DATE _____ **TIME** _____ **OUTSIDE TEMP** _____ **Supv. Init.** _____

Thrust Button Contact Uphill_____ Sec. Down Hill _____ Sec.

Thrust Button Housing Temp Uphill_____ Down Hill _____

Feed Pier Temperature SE _____ NE _____ SW _____ NW _____

Center Pier Temperature SE _____ NE _____ SW _____ NW _____

Discharge Pier Temperature SE _____ NE _____ SW _____ NW _____

Shell Condition _____

Other Observations _____

_____

_____

INSPECTIONS TO BE DONE TWICE A SHIFT *KILN # 2*

DATE _____ **TIME** _____ **OUTSIDE TEMP** _____ **Supv. Init.** _____

Thrust Button Contact Uphill_____ Sec. Down Hill _____ Sec.

Thrust Button Housing Temp Uphill_____ Down Hill _____

Feed Pier Temperature SE _____ NE _____ SW _____ NW _____

Center Pier Temperature SE _____ NE _____ SW _____ NW _____

Discharge Pier Temperature SE _____ NE _____ SW _____ NW _____

Shell Condition _____

Other Observations _____

_____

_____

KILN DUST LEVEL INSPECTION LOG

LN 1 BAGHOUSE	TIME 1	MOD A	MOD B	MOD C	TIME 2	MOD A	MOD B	MOD C
DIFFERENTIAL PRESSURE (IN MCC)								
OUTLET TEMPERATURE (IN MCC)								
SUCTION LEVEL LOW,MIDDLE, HIGH, NONE								
ROTARY VALVE RUNNING								
ROTARY VALVE ADJUSTMENT MADE								
VAC TRUCK LOADS TAKEN								
ROTARY VALVE MAINTENANCE NEEDED								
BAGHOUSE BLOWER SELECTED	NORTH OR SOUTH				NORTH OR SOUTH			

KILN 1 MULTICLONE	HOPPER LEVEL	HOPPER LEVEL
TIME 1	UPPER	LOWER
TIME 2	UPPER	LOWER
ROTARY VALVE ON	YES OR NO	
RV MAINT NEEDED	YES OR NO	
BLOWER SELECTED	EAST OR WEST	

BAGHOUSE DUST LINES TO SILO-MAINTNENANCE NEEDED-

MULTICLONE DUST LINES TO SILO-MAINTENANCE NEEDED-

KILN 2 BAGHOUSE	TIME 1	MOD A	MOD B	MOD C	TIME 2	MOD A	MOD B	MOD C
DIFFERENTIAL RESSURE (IN MCC)								
TLET EMERATURE (IN MCC)								
SUCTION LEVEL LOW, HIGH, NONE								
ROTARY VALVE RUNNING								
ROTARY VALVE ADJUSTMENT MADE								
VAC TRUCK LOADS TAKEN								
ROTARY VALVE MAINTENANCE NEEDED								
BAGHOUSE BLOWER SELECTED	NORTH OR SOUTH				NORTH OR SOUTH			

KILN 2 MULTICLONE	HOPPER LEVEL	HOPPER LEVEL
TIME 1	UPPER	LOWER
TIME 2	UPPER	LOWER
ROTARY VALVE ON	YES OR NO	
RV MAINT NEEDED	YES OR NO	
BLOWER SELECTED	EAST OR WEST	

BAGHOUSE DUST LINES TO SILO- MAINTENANCE NEEDED-

MULTICLONE DUST LINES TO SILO-MAINTENANCE NEEDED-

WAS THE VAC TRUCK CLEAN AND READY FOR YOUR USE?

DID YOU EMPTY AND CLEAN VAC TRUCK AFTER YOUR USE?

WAS THE EQ ROOM CLEAN AT THE BEGINNING OF YOUR SHIFT ?

DID YOU CLEAN FILTER BASKETS DURING YOUR SHIFT?

UID WASTE DRUM LEVEL ¼ ½ ¾ FULL PPE WASTE DRUM LEVEL ¼ ½ ¾ FULL

IS EQ ROOM CLEAN AT END OF SHIFT ? ***

*** REQUIRES 1 EMPTY PAIL, DRIP PANS CLEAN AND NO USED PPE

ARE DRUMS AND PAILS PROPERLY LABELED?

DATE_____SHIFT_____ NAME_____SUPERVISOR_____

NORLITE CORPORATON
Policy Number: OM 3-01
Effective Date: 9/03

PREVENTIVE MAINTENANCE PROGRAM

I. PURPOSE

Provide a consistent and reliable system for the preventive maintenance of plant systems and equipment.

II. SCOPE

Norlite Corporation Facility.

III. RESONSIBILITIES

The maintenance manager has the overall responsibility of the preventive maintenance program.

IV. PROCEDURES

The preventative maintenance system is made up of the following components.

PM Work Orders

A group of preventative maintenance (PM) work orders have been generated for plant systems and equipment. As new equipment is added to the plant, or if experience shows the plant equipment needs additional or different preventative maintenance, new PM work orders are added to the system or existing PM work orders are changed to meet the new requirements.

The PM work orders are divided into the following frequency

Weekly, Monthly, Bi-Monthly, Quarterly, Semi-Annual, and Annual

Each PM work order list the inspection or maintenance activity required.

PM Summary

The PM summary is a file that shows the status of all PM work orders issued.

As a PM work order is generated, the PM summary is updated to show the issue date of that particular PM work order.

When the PM work order is completed, the PM summary is updated to show the completion date

PM Work Order File

After the completed PM work order is entered into the PM summary, the hard copy is filed for future reference.

NORLITE CORPORATON
Policy Number: OM 3-02
Effective Date: 9/03

CORRECTIVE MAINTENANCE PROGRAM

I. PURPOSE

Provide a consistent and reliable system for the corrective maintenance of plant systems and equipment.

II. SCOPE

Norlite Corporation Facility.

III. RESONSIBILITIES

The maintenance manager has the overall responsibility of the preventive maintenance program.

IV. PROCEDURES

The corrective maintenance system is made up of the following components.

Routine Inspections

All operating areas perform routine inspections daily. Equipment problems noted on these inspections are addressed immediately or added to the area work list for completion during future overhaul periods

Work list

The work list is divided into the major plant areas such as Kiln 1, Kiln 2, Fuel Farm, Waste Water Treatment, etc.

In addition, each area division is made up of two groups of information.

Outage Routines

The outage routine is the day to day schedule used to coordinate maintenance activities and personnel during plant shutdowns.

The outage routine is generated using the area work list future maintenance and repair entries.

When the outage is over, the outage routine is used to update the work list completed maintenance and repair entries.

Outage Routine File

At the end of an area outage, a hard copy of the complete outage routine is filed for future reference.

NORLITE CORPORATON
Policy Number: OM 3-03
Effective Date: 9/03

SPARE PARTS MAINTENANCE PROGRAM

I. PURPOSE

Provide a consistent and reliable system for the control and replacement of spare parts involved in the maintenance of plant systems and equipment.

II. SCOPE

Norlite Corporation Facility.

III. RESONSIBILITIES

The maintenance manager has the overall responsibility of the spare parts maintenance program.

IV. REFERENCES

Spare parts for the plant equipment are controlled as follows.

Equipment List

The equipment list is a file of equipment repair parts. The equipment list includes stocked and non-stocked parts.

As new equipment is added to the plant systems, or as additional repair part requirements are identified, the file is updated.

Parts Ordering

Parts are ordered as follows.

When a maintenance or repair requirement is added to the corrective maintenance work list, the parts requirements are evaluated and the spare parts stock is checked to verify part availability. If the parts required are not stocked on site, the parts are ordered and staged for the next available outage.

At the end of each area outage, the outage routine is used to generate a parts replacement order based on input from the personnel who performed the actual repairs.

The day to day maintenance activity is reported to the maintenance supervisor. This report includes any spare parts used to complete the repairs. The maintenance supervisor orders and stores the spare parts upon receipt.

Frame assy, cooler window air seal	COOLER	FFE Minerals	111-30-5-6797-00			800-523-9482	Block House	: NEW + 1 USEI	0	
Packing, felt, cooler shaft air seal, 3-15/16" Dia	COOLER	FFE Minerals	111-10-5-6947-03		Used on 3-15/16" dia. (East) crosshead wheel shaft	800-523-9482	Block House		2	
Packing, felt, cooler shaft air seal, 5" Dia	COOLER	FFE Minerals	111-10-5-6947-07		Used on 5" dia. (West) crosshead wheel shaft	800-523-9482	Block House	2		
Pin, shear, cooler driven sprocket	COOLER	FFE Minerals	111-58-1-0346-01			800-523-9482				
Plate, grate, flat, universal, cast steel	COOLER	Temperform Corp.	TC5000-U1		U1 denotes 2" lip height; 16.25" long; Fuller # 111-82-3-092	800-227-8464	Pole Barn	30	4	
Plate, grate, RFT (pocket), center, stainless	COOLER	FFE Minerals	111-92-4-0900-90 Rev. 4		Mat'l: 2512 cast stainless; Reduced Fall Thru (RFT)	800-523-9482	Pole Barn	10		
Plate, grate, RFT (pocket), center, stainless	COOLER	Temperform Corp.	LE-55PC-1		Alloy HH (stainless),25% Cr,12% Ni.,Fuller #111-92-4-0900	800-227-8464	Pole Barn	53	5	
Plate, grate, RFT (pocket), LH, stainless	COOLER	Temperform Corp.	LE-55PC-1L		Alloy HH (stainless), 25% Cr, 12% Ni., Fuller #111-93-4-09	800-227-8464	Pole Barn	15	2	
Plate, grate, RFT (pocket), RH, stainless	COOLER	Temperform Corp.	LE-55PC-1R		Alloy HH (stainless), 25% Cr, 12% Ni., Fuller #111-93-4-09	800-227-8464	Pole Barn	14	1	
Plate, side casting, LH, kiln cooler, cast stl.	COOLER	Temperform Corp.			Standard Wear Plate, Fuller #111-54-2-0589-12	800-227-8464			47	
Plate, side casting, RH, kiln cooler, cast stl.	COOLER	Temperform Corp.			Standard Wear Plate, Fuller #111-54-2-0589-18	800-227-8464			47	
Shaft, coupling, Kiln cooler screw	COOLER	FMC/Troy Belt	170-33-8		2-7/16" dia., 15-1/2" long, (4) 11/16" holes in-line	518-272-4920	Block Building	5		
T-bolt assembly, Kiln cooler plates	COOLER	Temperform Corp.			5/8" dia. x 7-1/2" NF; Fuller # 111-92-1-4706-00	800-227-8464	Block Building	115/232/53		
Wheel assy, 3.5" bore, cooler wheel shaft	COOLER	FFE Minerals	111-62-2-0238-51		3.5" dia. bushing bore, independent wheel shaft	800-523-9482	Block House	2	0 IN Pole Barn	
Wheel assy, 4.0" bore, cooler crosshead shaft	COOLER	FFE Minerals	111-62-2-0237-50		4" dia. bushing bore, connected to drive shaft with arm	800-523-9482	Block House	1	3 IN Pole Barn	
Wicket, cooler inspection window cover	COOLER	FFE Minerals	111-54-3-0296-04		Uses lever P/N 111-54-3-0296-01	800-523-9482	Block House	1	4	
Air Handling Unit	FF	Industrial Air Systems	HWAC-115 HRS	92-4439-1		612-646-9631				
Barrier Fluid Resevoir	FF	John Crane / Lemco	LMLF-31T1-P31	SN 92753	dated 1992, 450 psi, -20 to 100 deg F.					
Bearing, 100C & 200C Pumps	FF	SKF / Applied	33111/Q		2 required for full change	518-427-5800	Central SH F2	8		
Bearing, Vacuum Pump	FF	SKF	6314 JEM				Central SH F12			?#
Bearing, Vacuum Pump	FF	SKF	NJ 314 ECM / C3							?
Belt, Cog, 100C & 200C pumps	FF	Gates/Troy Belt	8M-896-62		(1) required for operation	518-272-4920	Central			
Belt, "V", Gear pump, Frac	FF	Goodyear/Troy belt	3VX475		4 required for full change	518-272-4920				
Bottle, Sample	FF	Birch Bottle	1ERB161LN		16 oz Flint, 70/450, w/2WP0706PX Cap.					
Bushing, Godwin Pump	FF	Kaman	SK x 48 mm				Central SH L34	1		
Bushing, Vacuum Pump, (Pump Side)	FF		SF x 2-3/8				Central	2		
Casing, Impeller, FF lower pad pump	FF	Durco/Rolfe Industries	AT100, CD4M		Material: CD4M, for Mark III 2K3x2-13	518-383-2244				
Casing, Impeller, FF waste oil pump	FF	Durco/Rolfe Industries	AT100, CS		Material: CS, for Mark III 2K3x2-13	518-383-2244				
Coupling Insert, Barrel Augur	FF	Love Joy/Troy/Applied	L-099 / L-100				Central SH L9	1	5	
Coupling Insert, Oil Unloading	FF	Love Joy/Troy / Applied	L110SOX				Central SH L9			
Coupling, Barrel Augur Drive (Test)	FF	Alra-Flex			Hub: MO, 1.250 Both Sides Insert: MO		Central SH L17			
Coupling, Hub, Barrel Augur Drive (Both Sides)	FF	Lovejoy/Troy Belt	L100 x 1.250				Central SH L17			
Coupling, Hub, No. 2 Fuel Oil Pump	FF	Lovejoy/Applied	LO 75		Mtr Hub P/N. 10688, Pp Hub P/N. 28875, Insert: LO75					
Coupling sleeve, FF Building Heating Pumps	FF	SureFlex/Troy Belt	No. 4J		Hubs unknown	518-272-4920				
Coupling sleeve, FF lower pad pump	FF	SureFlex/Troy Belt	No. 8J		Hubs unknown	518-272-4920				
Coupling sleeve, FF waste oil pump	FF	SureFlex/Troy Belt	No. 8J		Hubs unknown	518-272-4920				
Coupling, Oil Unloading, both halves	FF	Love Joy/Troy / Applied	L110		Hubs Req'd: Pp = 1-1/8" & Mtr =1-5/8" w/3/8" KW		Central SH L11	1 COMP WITH INSERT		
Cover, Inspection, Godwin Pumps	FF	Godwin	23.0552.0115				Central SH L34	1		
Cover, rear, FF lower pad pump	FF	Durco/Rolfe Industries	AS106D, CD4M		Material: CD4M, for Mark III 2K3x2-13	518-383-2244				
Cover, rear, FF waste oil pump	FF	Durco/Rolfe Industries	AS106D, CS		Material: CS, for Mark III 2K3x2-13	518-383-2244				
Diaphragm, Air Pump (2")	FF						Central SH I11	1 Set		
Filter, FF Godwin Unloading Pump Priming	FF	Godwin	23.0586.9923			716-344-3156				
Gasket, gland, FF lower pad pump	FF	Durco/Rolfe Industries	2Z190G		Teflon gasket	518-383-2244				
Gasket, gland, FF waste oil pump	FF	Durco/Rolfe Industries	2Z190G		Teflon gasket	518-383-2244				
Gasket, impeller, FF lower pad pump	FF	Durco/Rolfe Industries	2Z104		1-7/8" shaft	518-383-2244				
Gasket, impeller, FF waste oil pump	FF	Durco/Rolfe Industries	2Z104		1-7/8" shaft	518-383-2244				
Gasket, rear cover, FF lower pad pump	FF	Durco/Rolfe Industries	AS107		13" teflon gasket	518-383-2244				
Gasket, rear cover, FF waste oil pump	FF	Durco/Rolfe Industries	AS107		13" teflon gasket	518-383-2244				
Gauge, pressure, FF lower pad pump	FF	Wika Instrument Corp.	9767061		0-100 psi, 2-1/2" face,1/4" NPT/LM, Type 213.53					
Gauge, pressure, FF outside tank	FF	McMaster-Carr	3846K81		0-15 psi, 1 psi intervals, 0.5 psi graduations, 4-1/2" face	732-329-3200				
Handle, Valve, Inside Tank	FF	Marwin	HA20SS250F				Central SH H2	1		
Impeller, FF lower pad pump	FF	Durco/Rolfe Industries	AT1030P		Material: CD4M, for Mark III 2K3x2-13; 13" trim	518-383-2244				
Impeller, FF waste oil pump	FF	Durco/Rolfe Industries	AT103RV		Material: (DCI) ductile cast iron, for Mark III 2K3x2-13; 9.0" t	518-383-2244				
Nut, FF Godwin Pumps	FF	Dougleas	M12 wirh 1.75 thread		metric	518-274-5091				
O-ring, FF Lower Pad pumps Bearing Carriers	FF	Durco/Rolfe Industries	2K201B			518-383-2244				
O-ring, FF Lower Pad pumps Bearing Hsg Adapter	FF	Durco/Rolfe Industries	2Z131			518-383-2244				
Packing, Agitator	FF	Chesterton	14R-4500x63-7		4.5x5.75x0.625x0.625, 7 R/S, 1 Set/Agitator		Super. Locker			
Packing, stuffing box, LGF Inside tanks	FF	Philadelphia Mixers	30000-3076		82" per tank	717-832-8873				
Pin, Retaining, Godwin Pumps	FF	Godwin	23.0553.0111				Central SH L34			
Plate, backing, FF LGF Godwin pumps	FF	Godwin	12.0289.0115		Casting No. 12.0289 ML80					
Pressurizing system, FF, Cabinet N2 Purge	FF	Bebco Ind./ Fox Agency	1001A-LPS-CI-Z-TM		With EPV-1-SA-00 Vent AND SMK-1 Mounting kit	800-833-4330				
Pump, Anti-freeze	FF	Warren Rupp / Rolfe Ind.	SB1-A Type SB-4-A	436117	SandPIPER pneumatic diaphragm pump	518-383-2244				
Pump, Lower Pad, Outside Tk 300 - 600	FF	Durco/Rolfe Industries	2K3X2-13/126	347215	45 psi. minimum required at kilns	518-383-2244				
Pump, Off-load	FF	Godwin	0230 DP10	9220374	Type HL80					
Pump, Waste Oil	FF	Durco/Rolfe Industries	2K3X2-13/90	375712(E),375711(W)	No specific pressure requirements	518-383-2244				
Rupture Disc, FF, Inside Tank 200A Only	FF	Continental Disc	CDCV + BDI		6" FOR Tank 200A Only, Use separate BDI		Central SH H6	0		
Rupture Disc, FF, Inside Tanks	FF	Continental Disc	Cal-Vac (MFG # 301029)		6" For Tanks 100A, 100B, 100C, 200B AND 200C		Central SH H6	4+1	1	
Rupture Disc, FF, Outside Tanks	FF	Continental Disc	ENV III (MFG # 314410		6" For Tanks 300, 400, 500 & 600 (Outside)		Central SH H6	1	6	
Seal, FF Inside LGF pump	FF	Frederick Seals	$MEC Liberator Seal		2-1/2" shaft size	518-423-2081				
Seal, FF lower pad pump	FF	Frederick Seals	$MEC Dbl Bellows		1-7/8", Double Bellows Mechanical Seal	518-423-2081				
Seal, FF waste oil pump	FF	Frederick Seals	5E2Z3VH		1-7/8", Old Reliable	518-423-2081				
Shaft, pump, FF LGF Godwin pumps	FF	Godwin	16.0685.8821							
Sight Glass, FF Mission Pump Barrier Fluid	FF	John Crane Lemco	LKT-00T1-001			918-835-7325				
Sleeve assy, shaft, A & B pumps	FF	Mission Fluid King	20613-21G7A		641102181, Applied Process Technology	803-831-8253				
Universal Joint, Barrel Augur	FF	Spicer/Albany Universal	Spicer P/N 5-178X		NAPA P/N 331		Central SH I17	1		
Universal Joint, Barrel Augur	FF	Chicago Rawhide	UJ338	Both Yokes: 1/4" KW	1-1/4" Yoke P/N: UJ1552, 1" Yoke P/N: UJ1524					
Valve, ball, 4"-150# flanged, full port	FF	Apollo/Collins Pipe	88-24A-01		4"-150# flanged, full port, SS ball & stem, RTFE seats	800-876-5406				
Valve, ball, FF, 1-1/2" Flanged Ball recirculators	FF	Apollo	88A-147-24		RTFE body & seals, SS ball & stem, Steel WCB 150 1-1/2					
Valve, check, FF, Unloading Pump Nitrogen Prime	FF	Conbraco/Uncle Sam	62-103-01		1/2" F x 1/2" F, ball cone check valve	518-235-1610	Supervisor Cabinet	1		

An up-to-date list is available from the maintenance manager.

Valve, Check, Lower Pad Pumps	FF		NIBCO/FW Webb	F918B		3" Cast Iron, Flanged, 9-1/2" AOL					
Valve, FF Vent line, actuated, inside tanks	FF		Watts	2" C7450M102SS		2" ball valve, EDP #0429906					
Valve, plug, 2"-150# flanged, FF raceways	FF		Durco, CPI Controls	2-DG411A-DCI/D4		2"-150#, flanged, DCI body, 316SS plug,	518-785-8412				
Valve, plug, 3"-150# flanged, FF raceways	FF		Durco, CPI Controls	G411 DI D4		3"-150#, flanged, DI body SS plug	518-785-8412				
Adapter, bearing housing, recycle pump	K		Durco/Rolfe Industries	YH108		For Mark III 2K2x2R-10	518-383-2244				
	4 K		Worcester/CPI	MK508				Central SH G3	1		
Adapter, Valve Actuator	K		Worcester/CPI	MK503				Central SH G3	1		
Basket, strainer, blowdown line	K		Hayward/Uncle Sam	BS102001/8				Central SH H18	3		
Basket, strainer, recylce line	K		Hayward/Uncle Sam	#72	Used in Hayward	ST 268-T4 3" strainer; MC P/N 4454K132 without screen	732-329-3200				
Basket, Strainer, EQ Room	K		Hayward/Uncle Sam	ST264SOXX		1/2" Holes					
Bearing, baghouse rotary feeders	K		SKF	FY1-3/4 TF		2 required, 4 BOLT FLANGE	518-427-5800				
Bearing, baghouse rotary valve (Insert Only)	K		SKF/Applied Ind. Tech	YAR 209-112-2F		1-3/4"	518-427-5800	Central SH F13	6	0	
Bearing, Blowdown pump, inner	K		SKF/Applied Ind. Tech	6207 2RSJEM		Sealed bearing, for Durco Mark III pumps, size 1J2X2R	518-427-5800	Central SH F3	4		
Bearing, Blowdown pump, outer	K		SKF/Applied Ind. Tech	5306 A/C3		Sealed bearing, for Durco Mark III pumps, size 1J2X2R	518-427-5800	Central SH F2	4		
Bearing, Cooler screw drive shaft, Thrust	K		Martin /Applied	CTH5D		Alt: FMC P/N 153-130-K	518-272-4920	Overhaul Box	2		
Bearing, Cooler Screw, Cone, Dr. Shft/Thrust Assy	K		Timken/Applied	39585				Central SH F11	2		
Bearing, Cooler Screw, Cup,Dr. Shft/Thrust Assy	K		Timken/Applied	39520				Central SH F11	2		
Bearing, Cooler screw, HI (backup)	K		Martin/Applied Ind Tech	CHB2205MHI		2-7/16" bore, hard iron; uses hanger 12CH2265	518-427-5800	Central SH F6	12 Set		
Bearing, Cooler screw, nylon	K		Martin/Applied Ind Tech	CHB2205N		nylatron bearings 2-7/16". Uses hanger 12CH2265	518-427-5800	Central SH F6	16-1/2		
Bearing, Cooler, complete sleeve & housing	K		Dodge	005094	P4B-BZR-415	4-15/16" shaft; bronze, bushing P/N 005083, pin P/N 00505	518-427-5800				
Bearing, Recycle pump 2K-2x2-10, inner	K		SKF/Applied Ind. Tech	SKF-310C3		For Durco Mark III pumps	518-427-5800				
Bearing, Recycle pump 2K-2x2-10, outer	K		SKF/Applied Ind. Tech	5310 ANR/C3		For Durco Mark III pumps, sealed double rollers	518-427-5800	Central SH F2	4		
Bearing, Recycle pump 3x2-10, inner	K		SKF/Applied Ind. Tech	6310 2RSJEM		For Durco Mark II pumps, sealed single roller	518-427-5800	Central SH F3	3		
Bearing, Recycle pump 3x2-10, outer	K		SKF/Applied Ind. Tech	5310 ANRH/C3		For Durco Mark II pumps, snap ring	518-427-5800	Central SH F2	--		
Bearing, Screw, Soda Ash	K	YES	Sealmaster	SF-24		1-1/2" Bore, 4 Bolt Flange Bearing		Central SH F13			
Bearing, Screw, Vacuum Truck	K	YES	Sealmaster	SF-24		1-1/2" Bore, 4 Bolt Flange Bearing		Central SH F13			
Belt, "V", Brick saw	K		NAPA	4L440		2 required	518-782-7180				
Belt, "V", CEM air compressor	K		Goodyear/Troy belt	3VX450		2 required for full change	518-272-4920				
Belt, "V", Lime blowers (A, B, & C)	K		Goodyear/Troy belt	3VX500		3 required for full change	518-272-4920				
Belt, "V", Lime blowers (D Only)	K		Goodyear/Troy belt	3VX560		3 required for full change	518-272-4920				
Blade, scraper, T-bar, 24"	K		Rema/Troy Belt	650		$165.00, 2 days	518-272-4920				
Blower, Baghouse, K1 & K2	K		Gardner Denver, Duroflow	GGDBAAA		Cat. # 4506 VT	770-486-5655	Block House	1	1	
Blower, Lime, K1 & K2	K		Gardner Denver, Duroflow	GGDBAAA		Cat. # 3006 VT	770-486-5655	Block House	2		
Blower, Multiclone, K1 & K2	K		Gardner Denver, Duroflow	GGDBAAA		Cat. # 4506 VT	770-486-5655	Block House	--		
Bolt, Kiln Feed Inside Chute Flange	K		Douglas	1/2" x 2"		12 Required					
Bolt, Cooler crank disc to Drive Sprocket	K		McMaster Carr	1"x2" shoulder screw		Last PO 970121		Block House	24		
Bolt, Cooler crosshead wheel shaft	K		Douglas Ind. Fastener			7/8"-9 UNC x 12", Gr. 8, (20) required	518-274-5091	Block House			
Bolt, Cooler Beams (Fixed Grates)	K		Douglas Ind. Fastener	5/8x3-1/2" Plow Bolt		4 ea. Bolts, Flats, Locks, & Std Hex Nut Per Beam					
Bushing, Blower, Lime, Drive Sheave	K			SH x 1-5/8							
Bushing, Blower, Lime, Drive Sheave	K			SH x 1							
Bushing, Fan, Silo Heat, Drive Sheave	K			SH x 1-1/8							
Bushing, Fan, Silo Heat, Drive Sheave	K			SH x 1-7/16							
Bushing, Screw, Soda Ash, Drive Sprocket	K	YES		2012 x 1-7/16							
Bushing, Screw, Soda Ash, Driven Sprocket	K	YES		2517 x 1-1/2							
Cable Ties, Scrubber Pads	K		Panduit/Wolberg Elec	PLT4H-TL76							
Casing, impeller, Kiln blowdown pump	K		Durco/Rolfe Industries	RA100, CD4M		Material: CD4M, for Mark III 2x2R-6	518-383-2244				
Chain, #60, Soda Ash Screw Drive	K	YES	Applied Ind. Tech				518-427-5800				
Clamp, soda ash screw conveyor cover	K		Martin/Applied Ind. Tech.	CSC-2			518-427-5800				
Coalescer, Kiln CEM air compressor	K		Hankison/AC Engineering	A18-03-16-DG	9512	MWP 175 psig, MOT 120 oF, auto drain, cartridge #0713-2	518-371-4401				
Collar, shaft seal, Kiln blowdown pump	K		John Crane/Rolfe Ind. Inc.	AY38034B-H		For Mark III 2x2R-6; Crane P/N ?????	518-383-2244				
Collar, shaft seal, Kiln recycle pump	K		John Crane/Rolfe Ind. Inc.	AY38034C-H		For Mark III 2K2x2R-10; Crane P/N B000-29	518-383-2244				
Compressor, air, Kiln CEM building	K		Powerex/Kinequip	SLP05	UE108	5HP, 3 ph., 208V; replacement air end #SLAE05, 2 SCFM	716-694-5000				
Cooler	K		Fuller/FFE Minerals		622H	Fuller Horizontal Clinker Cooler	800-523-9482				
Cooler screw	K		Northern Cross Conveyor								
Coupling Insert, Soda Ash Blower	K		Love Joy/Troy Belt	11494 (L099/L100)			518-272-4320				
Coupling, Blower, Soda Ash	K		Lovejoy	L100		Blower Side Bore: 0.075, Motor Side Bore: 1.125					
Coupling, Pump, Quinch Water	K	YES	Omega/Kaman	ES3-R				Central SH I17			
Coupling Insert, Nozzle Water	K		Woods/Troy Belt	6JE				Central SH L9	--		
Coupling, Pipe, 4 Bolt, Kiln Dust Pipe	K		Morris	010 350 4B 2FG		4 Bolt, 3-1/2" With Black Gasket	800-426-1579				
Coupling, Nozzle Water Pumps	K		Woods/Troy Belt/Applied			Two 6SC35 Hubs. One 6SCH x 7/8, One 6SCH x 1-3/8		Central SH L			
Coupling, K, Silo Shale Weigh Feeder tail pulley	K		Falk/Troy Belt	1015G Type G20		1.625" reducer & 2.0" pulley shafts, interference fit	518-272-4920				
Coupling, kiln blowdown pump	K		Wood's/Troy Belt	See comments		6SC-H 7/8" motor hub	518-272-4920				
Coupling, Kiln recycle pump	K		Woods/Troy Belt	7SC		Motor 7SC-HX1, pump 7SC-HX1.125, spider hub 7SC35, h	518-272-4920				
Coupling, kiln Recycle Pump (New Style)	K		Woods/Troy Belt	8SC		Mtr: 8HX 1-7/8, Pp: 8HX 1-1/8. Insert: 8JE, Flg: 8SC50		Central SH L9 & 10			
Coupling, Kiln Soda Pump, South,	K			6J		hubs unknown	518-272-4920				
Coupling, Multiclone Rotary Valves	K							Central SH L11	--		
Coupling, Shale Rotary Feeder Motor to Gearbox	K		Dodge	41510116P						2	
Cover, rear, Kiln recycle pump	K		Durco/Rolfe Industries	AH106D, CD4M		Material: CD4M, for Mark III 2K2x2R10	518-383-2244				
Crank Arm, K, Cooler	K		Fuller/FFE Minerals					Pole Barn Floor	2		
Deflector, inboard, blowdown pump	K		Durco/Rolfe Industries	1K114-TFEC		Prevents seal blowout into bearing housing	518-383-2244				
Deflector, inboard, recycle pump	K		Durco/Rolfe Industries	2Z114-TFEC		Prevents seal blowout into bearing housing	518-383-2244				
Disk Pack, K Cooler	K		Rexnoid					Block Building	2 SETS (36 TOT)		
Filter Bag, K Vacuum Truck (Guzzler)	K		Guzzler	12646223			800-622-8765	Pole Barn	60	30	
Filter, Air, Control Rooms	K		McMaster-Carr	2122K328		1 In. Thick Polyester		Block Bldg			
Filter, Air, Control Rooms	K		Grainger	4WZ63		25"Wx135"Lx1/2"THK					
Filter, Air, Baghouse Blowers	K		Gardner Denver	211666B		Napa P/N 6343 req's modification, 7.75" O.D., 9.5" H	901-542-6100	Block House	4	12/8/99	
Filter, Air, Air Compressor, CEM	K		Hankison/AC Engineering	T20-03-16-DG	9512	120 oF wet/200 oF dry, auto drain, cartridge p/n E7-03, 1 m	518-371-4401				
Filter, air, K CEM air compressor	K		KINEQUIP	IP032901AV			518-762-8414				
Filter, Air, Rental Compressors	K		IR/Pratt	35393685				Tent Garage			

Flowmeter, K Scrubber Quinch,	K	Dwyer (Act #24340200)	VFC-142		0-10 gpm, 1 in. female npt connections	219-879-8000	Central SH I16	0	0
Gasket material, K Baghouse Rotary Feeders	K	Garlock/Troy Belting	3000			518-272-4920			
Gasket, Burner Nozzle	K	Flexcarb/FW Webb	2-1/2" 150 ASME	B16.20			Central	5	
Gasket, gland, Kiln blowdown pump	K	Durco/Rolfe Industries	1Z190G		Teflon gasket	518-383-2244			
Gasket, gland, Kiln recycle pump	K	Durco/Rolfe Industries	2Z190G		Teflon gasket	518-383-2244			
Gasket, impeller, Kiln blowdown pump	K	Durco/Rolfe Industries	1Z104TFR		1-1/8" shaft, Alternate P/N 1204	518-383-2244			
Gasket, impeller, Kiln recycle pump	K	Durco/Rolfe Industries	2Z104		1-7/8" shaft	518-383-2244			
Gasket, rear cover, kiln blowdown pump	K	Durco/Rolfe Industries	AA107		6" teflon gasket	518-383-2244			
Gasket, rear cover, kiln recycle pump	K	Durco/Rolfe Industries	AH107		10" teflon gasket	518-383-2244			
Gasket, Drop Bolt, Kiln Burner Hood	K	Flextex	RLS	1/8" THK x 2-1/2" W	FLEX #5669, Flex-DW, Knitted Fiberglass	215-646-1318			
Gasket, Scrubber, Nozzle, 4 Hole, Blind	K	Frank Murkin			5" OD, 2" ID. Four 3/4" holes. 1/4" Thick. Teflon				
Gasket, Scrubber, Nozzle, 4 Hole	K	Frank Murkin			5" OD, 2" ID. Four 3/4" holes, 1/4" Thick. Teflon		Supervisor Locker	1	
Gland, seal, Kiln blowdown pump	K	Durco/Rolfe Industries	1Z190H		Material: CD4M, for Mark III 2x2R-6	518-383-2244			
Gland, seal, Kiln recycle pump	K	Durco/Rolfe Industries	2Z190H		Casting # BT47778AB	518-383-2244			
Glass, K Burner Hood Viewing	K	Pyroceram/Sheffel's			3/16" x 11-1/2" x 11-1/2" See Packing For Rope	518-272-7041	Supervisors Locker	4	0
Glass, K Burner Hood Viewing	K	Pyroceram/Sheffel's			3/16" x 12" x 12" See Packing For Rope	518-272-7041	Supervisors Locker	1	0
Graphite, lubricating, Kiln tire	K	Cummings-Moore	205 Lubricating Graphite						
Grease, kiln CEM Compressor	K	Kinequip	IP600000AV		1 TUBE	518-768-8414			
Hanger, bearing, cooler screw	K	Martin	12CH2265		Hanger & bracket for bearing nylatron and hard iron		Central SH E6	10	
Hose, Kiln primary air fans	K	Troy Belting/McGill Hose	RFH		8" RFH Wire Wound Air Hose, 275 deg. F, ~ 12' per kiln	518-272-4920			
Hose, water, power washer	K	Thermoid/Albany Ladder	512280771		3/4" x 50' black with male & female hose ends	518-869-5335			
Impeller, Kiln blowdown pump	K	Durco/Rolfe Industries	RA103		Material: CD4M, for Mark III 2x2R-6; 4-5/8" trim	518-383-2244			
Impeller, Kiln recycle pump	K	Durco/Rolfe Industries	RB103PB		Material: CD4M, for Mark III 2K2x2R-10; 7.0" trim	518-383-2244			
Lagging, K1 top shale belt head pulley	K	Troy Belt	CL500-16		16" dia., 26" long, (8) 26" lengths required	518-272-4920			
Latern Ring, K Baghouse Rotary Feeder	K	Delta Ducon	15772		6" Perma/Flo Feeder, 15717A-T301	610-695-9700			
Mixer, K, Soda Ash Tank (South)	K	Lightnin/Sleweert	M/N 218-RELB-7.52	7.5 HP / Class 2	S/N: 6719396	518-272-3431			
Muffler, Air Dryers	K	Automuffler/Rolfe Ind	M/N M15		1-1/2" NPT				
Nozzle, Spray, scrubber	K	Spraying Sysytems Co.	1/8 GG-4.3W		Full Jet Nozzle, SS	603-471-0505			
Nozzle, spray, scrubbers	K	Spraying Sysytems Co.	3/8 HHSJ-TEF 6082		Spiral Jet Teflon	603-471-0505			
Nozzle, spray, scrubbers (OBSOLETE)	K	Spraying Sysytems Co.	3/8 HHS JX TEF 9082			603-889-5000			
Nozzle, tip, Kiln burner	K	Roy Industries	LSA200-45R		Material: 316L SS	304-768-0900			
Oil, Kiln trunnions	K	Mobile/Congress Oil	Mobile 634			518-584-3050			
Oiler, 4 ounce, Kiln recycle pumps	K	Trico/Rolfe Industries	42010		4 ounce oiler with side vent	518-383-2244			
O-ring, K blowdown pumps Bearing Carriers	K	Durco/Rolfe Industries	1Y201B			518-383-2244			
O-Ring, Strainer, Fuel	K	Murken					Super Cab #5		
O-Ring, Strainer Cover, LGF System	K	Hayward/Uncle Sam	ST264Z5				Supervisor Cabinet	2	
O-ring, K recycle pumps Bearing Carriers	K	Durco/Rolfe Industries	2K201B			518-383-2244			
O-ring, K recycle pumps Bearing Hsg Adapter	K	Durco/Rolfe Industries	2Z131			518-383-2244			
O-ring, Kiln recycle strainer cover	K	McMaster-Carr	9464K010		5" ID x 5.25" OD, Viton, package of 5	732-329-3200			
Packing, Kiln Burner Hood Viewing Window	K	McMaster-Carr	8850K12		1/2" knitted fiberglass rope, 1400 deg. F	732-329-3200	Supervisor Cabinet		
Packing, Baghouse Rotary Feeders	K	Garlock/Troy Belt	8909	5/16" Square			Central		
Pad, demister section halves, scrubber	K	Otto York/Guppenberger	AD-30128-01-REV 1	50-2FOB-EX80-02	120° Dia, 60" wide, 6" thick, 241 polypropylene	973-299-9200			
Paint Sticks, Hot Chalk	K	Calumet Dist. Group			X5 = White Paint Stick, 111= Holder	410-488-9133			
Pump, Blowdown	K	Durco/Rolfe Industries	IJ2X2R-6/45	382865	5 HP, 3490 RPM	518-383-2244			
Pump, Hydraulic, Kiln Pony Motor	K	Dynapower	880100/892673-35	PDM51597		803-760-5700			
Pump, Recycle	K	Durco/Rolfe Industries	2K2X2R-10/70	379776	Mark III Recessed Impeller Pump	518-383-2244			
Pump, Water, Kiln Brick saw	K	Little Giant Pump Co./Grainy	Cat. No. 50290						
Rail, Cooler wheel	K	Cardish/FFE Mineral				518-273-1713	Block Building		2
Receiver, Kiln CEM air compressor	K	Powerex	ST5050221V	12299SH-B4736		513-367-3121			
Reducer, shale feeder, shale silo	K	Boston Gear/Applied	FWC738 400B5G		400:1 right angle double reduction, 56C frame	518-427-5800	Pole Barn	1	
Rope, Fiberglass, High Density Flex, Live Silo Hatch	K	Flextex	7076		Sold in 160 ft boxes	215-646-1318			
Rotor, K Baghouse Rotary Feeder	K	Delta Ducon	15721-2		6" Perma/Flo Feeder, 15717A-T301	610-695-9700			2
Saw, brick	K	Norton Construction Prod.	CB202SY	63EM123990902		404-967-3954			
Screw, set, baghouse rotary valve	K	Woodward	5/8"-11 UNC x 1" long		Used to adjust vertical position of side plates	518-458-1141			
Seal Plate, Kiln Feedend & Discharge End	K	Barron Fan Tech	DA 301042-04-320		Approx 125 plates per seal (Min stock 300)	205-621-4321	Central SH K13	250	
Seal Plate Retainer Plates Feedend and Disch End	K	Cardish					Central SH K8	27	
Seal, Kiln blowdown pump	K	Frederick Seals	5E8C4E		1-1/8", Old Reliable	518-423-2081			
Seal, Kiln recycle pump	K	Frederick Seals	5E2Z3VH		1-7/8", Old Reliable	518-423-2081			
Seal, oil, Kiln blowdown pump, inboard	K	Durco/Rolfe Industries	BY50424G		Impeller side, for Mark III 2x2R-6	518-383-2244			
Seal, oil, Kiln blowdown pump, outboard	K	Durco/Rolfe Industries	BY50424B		Coupling side, for Mark III 2x2R-6	518-383-2244			
Seal, oil, Kiln Quinch Water Pumps	K	Mansville/Kaman	9848 (LWP-4)			518-783-8114			
Seal, oil, Kiln recycle pump, inboard	K	Durco/Rolfe Industries	BY50424D	ALT NO. 2Z118	Impeller side, for Mark III 2K2x2R-10	518-383-2244			
Seal, oil, Kiln recycle pump, outboard	K	Durco/Rolfe Industries	BY50424C		Coupling side, for Mark III 2K2x2R-10	518-383-2244			
Seal, "L" shaped, Kiln recycle pump	K	Frederick Seals	$MEC104674		1-7/8" shaft	518-423-2081			
Seat, O-ring ceramic, Kiln recycle pump	K	Frederick Seals	5Z2C3V or 1419187AA		1-7/8" shaft, Viton O-ring MTD Ceramic Seat	518-423-2081			
Seat, Recycle pump	K	Crane/Rolfe Ind	B00-30		1-7/8" shaft	518-383-2244			
Shaft, K Shale Rotary Feeder, Drive Side	K	Cardish				518-273-1713	Central SH J		1
Shaft, K Shale Rotary Feeder, Drive Side	K	Cardish				518-273-1713	Central SH K8	3	
Shaft, K Shale Rotary Feeder, Opposite Drive Side	K	Cardish				518-273-1713	Central SH K8	5	
Shaft, Kiln blowdown,	K	Durco/Rolfe Industries	1J105 (316SS)			518-383-2244			
Shaft, Kiln recycle pump	K	Durco/Rolfe Industries	2Y105 - ZH		Material: 316 SS, for Mark III 2K2x2R-10, 1-7/8" dia.	518-383-2244			
Sheave, Lime Blowers, (All But NE Blower),drive	K	Martin/Applied Ind. Tech.	3 3V 4.12 SH		Uses bushing SH, 1-5/8" shaft, 3 groove	518-427-5800			
Sheave, Lime Blowers, (All But NE Blower),driven	K	Martin/Applied Ind. Tech.	3 3V 4.12 SH		Uses bushing SH, 1.0" shaft, 3 groove	518-427-5800			
Sheave, Lime Blower, (NE Blower), Drive	K	Dodge/Applied Ind Tech	3/3V 4.5 SDS		Usees bushing SDSx1-5/8"	518-427-5800			
Sheave, Shale Silo Heat Fan, Drive	K	Dodge	2A3.6B4.0-SH		Use SH x 1-1/8" Bushing				
Sheave, Shale Silo Heat Fan, Driven	K	Dodge	2A3.6B4.0-SH		Use SH x 1-7/16" Bushing				
Shoe, K Baghouse Rotary Feeder	K	Delta Ducon	15720A		6" Perma/Flo Feeder, 15717A-T301	610-695-9700			
Sight glass, cooler viewing window	K	Sheffel's	Norlite SK-121897-01		4.25" Dia., 1/4" thick, tempered glass (PyrexTM)	518-272-7041			
Sight glass, Kiln viewing window (Alternate)	K	McMaster-Carr	8481K59		12" x 12" x 3/16" High temp. glass-ceramic, 1292 deg. F	732-329-3200			

Slide plate assy, cooler 3-15/16" shaft air seal	K		FFE Minerals	111-20-5-6974-03		Used on 3-15/16" dia. (East) crosshead wheel shaft	800-523-9482	Block House	0	2	
Slide plate assy, cooler 5" shaft air seal	K		FFE Minerals	111-20-5-6974-07		Used on 5" dia. (West) crosshead wheel shaft	800-523-9482	Block House	5		
Slide plate shield, cooler shaft air seal	K		FFE Minerals	111-10-5-6811-00		some of us call this "Z" channel; fits left or right sides	800-523-9482	Block House	4	0	
Spring assy, cooler window	K		FFE Minerals	111-10-5-6897-00		(2) required	800-523-9482	Block House	30	0	
Spring Collar Assy, Cooler, 3-15/16" Dia	K		FFE Minerals	111-20-5-6877-53		Used on 3-15/16" dia. (East) crosshead wheel shaft	800-523-9482	Block House		2	
Spring Collar Assy, Cooler, 5" Dia	K		FFE Minerals	111-20-5-7189-51		Used on 5" dia. (West) crosshead wheel shaft	800-523-9482	Block House		2	
Sprocket, Baghouse Rotary Valve, Drive	K		Martin/Applied Ind. Tech.	50BS15F x 1		1" shaft, 15 teeth, #50 chain, standard keyway	518-427-5800	Central SH I7	2		
Sprocket, Baghouse Rotary Valve, Drive	K		Martin/Applied Ind. Tech.	50BS18 x 1		1" shaft, 18 teeth, #50 chain, standard keyway, to speed up	518-427-5800	Central SH I7	1		
Sprocket, Baghouse Rotary Valve, Driven	K		Martin/Applied Ind. Tech.	50BS45 x 1-3/4 w/ 1/2 KW		1-3/4" shaft, 45 teeth, #50 chain, 1/2" keyway	518-427-5800	Central SH I7	5		
Sprocket, Cooler, Drive	K		Martin/Applied Ind. Tech.	160BTB12H 3020		Uses Taperlock 3020, 2-1/8" shaft	518-427-5800	Central SH I8	3		
Sprocket, Cooler, Driven	K		FFE Minerals	111-20-5-7129-72		4" dia. bushing bore, connected to drive shaft with arm	800-523-9482	Bone Yard	1		
Sprocket, Lime Feeder	K			41BS10 x 5/8				Central SH I7	2		
Sprocket, Multiclone Rotary Valve, Driven	K			50BS38 x 1-3/8		Use to increase speed of rotary feeder		Central SH I7	1		
Sprocket, Multiclone Rotary Valve, Drive	K		Martin/Appl. Ind./Troy Belt	50BS13F x 7/8		7/8" shaft, 13 teeth, #50 chain, 3/16" keyway	518-427-5800	Central SH L7I7	0		
Sprocket, Multiclone Rotary Valve, Driven	K		Martin/Applied Ind. Tech.	50BTB40 2012		1-3/8" shaft, 40 teeth, #50 chain, 5/16" keyway	518-427-5800	Central SH I7	2		
Sprocket, Soda Ash Screw, Drive	K	YES	Martin/Applied Ind. Tech.	60BTB30 2012		Uses bushing 2012, 1-7/16" shaft	518-427-5800	Central SH I7	1		
Sprocket, Soda Ash Screw, Driven	K	YES	Martin/Applied Ind. Tech.	60BTB60 2517		Uses bushing 2517, 1-1/2" shaft	518-427-5800	Central SH I7	1		
Studs, K Recycle Pumps	K		Durco/Rolfe Ind	1Z111			518-383-2244				
Tie, Cable, For Scrubbers	K		Pandult/Wolberg Elec	PLT4H-TL76							
Trolley, K Stack Test, mono-rails	K		Dayton/Graingers	2Z615A		1/2 Ton	518-869-1414				
Valve, ball check, scrubber blowdown lines	K		Hayward/Uncle Sam			2" CPVC True Union	518-235-1610				
Valve, ball check, scrubber blowdown lines	K		Hayward/Collins	TC10400S		4" CPVCTU, True Union	800-876-5406				
Valve, Ball, 1"	K		Apollo/Collins	70-145-01		Bronze Valve w/SS Ball, female NPT Threads both end		Central Rotobin			
Valve, ball, 1 "-150#, Blowdown Control Valve	K		Worcester/CPI	FZ5146TM150R6	Adapter MK508	flanged, SS ball & stem, bodyseal RTFE,	518-785-8412	Central SH G3	--		
Valve, ball, 1 "-150#, Soda Ash Control Valve	K		Worcester/CPI	FZ5146TM150R6	Adapter MK508	flanged, SS ball & stem, bodyseal RTFE,	518-785-8412	Central SH G3	--		
Valve, Ball, 1", CPVC, TU,	K		Hayward/Uncle Sam	TB2100ST w/ Viton O-Ring							
Valve, Ball, 1-1/2"	K		Apollo	70-147-01		Bronze Valve w/SS Ball, female NPT Threads both end					
Valve, Ball, 1-1/2", SS Ball & Body	K		Apollo/Collins	ODFC21500		Female NPT					
Valve, Ball, 2", CPVC, TU	K		Hayward/ Uncle Ssam	TB2200ST w/ Viton O-Ring							
Valve, ball, 2", 150#, with female NPT threads	K		Apollo/Collins/Webb	70-108-01		Hard Chrome Ball		Central			
Valve, Ball, 2", Flanged, LGF System	K		Apollo/Collins	88A-148-24				Central	1		
Valve, ball, 4", 150#, with female NPT threads	K		Apollo/Collins/Webb	70-10A-01		Hard Chrome Ball		Central			
Valve, ball, Kiln baghouse cleanout	K		Conbraco/Collins	4" 78-255-01		4" full port, threaded, bronze body, TFE packing	800-876-5406	Central SH J12	2		
Valve, ball, Kiln oil & LGF lines	K		Apollo/Collins Pipe	77-105-01		600 psi threaded, full port, RTFE seat	800-876-5406				
Valve, Butterfly, 2"	K		Bray/Uncle Sam	31/119							
Valve, butterfly, 3" PVC, scrubber	K		Hayward	BY110300EL		EPDM liner & seal, polypropylene disc	518-235-1610				
Valve, butterfly, 4" PVC, scrubber	K		Hayward	BY110400EL		EPDM liner & seal, polypropylene disc	518-235-1610				
Valve, check, Kiln baghouse blowers, wafer	K		Stockham/Uncle Sam	g. No. WG970 4 CI WAFER		Size 4.; Meuller P/N 71AHB-3	518-235-1610	Central SH G	2		
Valve, check, Kiln lime blowers, silent	K		Milwaukee Valve/VanAmbur	2" Model 1400	M/N 1402-200	Manufactured by Milwaukee Valve Company	518-436-3136	Central SH H14	8		
Valve, diaphragm, Lime Silo Dust Collector	K		ASCO/Sager Spuck	8353C33			518-436-4711				
Valve, rotary, baghouse	K		Delta Ducon	15717A-T301		6" Perma/Flo Feeder, 0.011" clearance	610-695-9700				
Valve, rotary, multiclone	K		W W. Meyer/D F. Brandt	6x6 HD	180733-1	.007-.010 end clearance, .008-.010 tip clearance	708-673-0312	Block Building	2	1	
Valve, solenoid, Kiln Airtek dryers	K		Parker/Rolfe Industries	743220115B	Airtek P/N TP8101-1	0-150 psi, 120V, 60 Hz, 6.9 W	518-383-2244			0	
Washer, K Baghouse Rotary Feeder	K		Delta Ducon	4T-269		6" Perma/Flo Feeder, 15717A-T301	610-695-9700				
Bearing Pins, Trunnion Bearings	K1		Cardish Machine			1.5" OD x 4" Lg and 1.5" OD x 12" Lg., Carbon Steel		Central SH L29	2 Sets		
Bearing, Barron fan	K1		Dodge	042017	P4B-516-SFXT-211-TT	(2) Seals 24TT211, (1) brg 22216KC3, (1)adptr H316SNW;	518-427-5800	CENT SHF1 & 16	1 SET	+2 EXTRA HSG	?
Bearing, Clinker belt head pulley	K1		Dodge	126818	P2B-SCM-207	2-7/16" shaft, ball bearing, med. duty, pillow block	518-427-5800	Central SH E2	--		?
Bearing, Clinker belt tail pulley	K1		Dodge	126818	P2B-SCM-207	2-7/16" shaft, ball bearing, med. duty, pillow block	518-427-5800	Central SH E2	--		?
Bearing, Cooler drive chain idler	K1			6212 2ZJEM				Central SH F3	1		
Bearing, Cooler, East fan	K1		Link Belt/Applied Ind Tech			PU347 = Non-Exp, PEU = Exp		Central SH E3	1 each		
Bearing, Cooler, W fan, bearing insert (OBSOLETE)	K1		Dodge		Timken # 39243 DEE	2-7/16" shaft; bearing insert for drive or driven side	518-427-5800	Central SH E5	2		?
Bearing, Cooler, West fan, expansion	K1		Dodge	037020	P4B-IP-207E	4 bolt base, 2-7/16" shaft, opposite drive end	518-427-5800		1		?
Bearing, Cooler, West fan, non expansion	K1		Dodge	037812	P4B-IP-207	4 bolt base, 2-7/16" shaft, drive side	518-427-5800		2		?
Bearing, Heat Exchanger Fan	K1		Link Belt/Applied Ind Tech	PU339 & PEU339		PU Fixed, PEU Expansion, 2 Bolt, 2-7/16" shaft	518-427-5800	Central SH E3	1 each		
Bearing, Heat Exchanger Fan (New)	K1		SKF	SYR 2-15/16 H		Non-Expansion (Sheave End) Bearing		Cetral SH E3	2		
Bearing, Heat Exchanger Fan (New)	K1		SKF	SYR 2-15/16		Expansion (Fan End) Bearing		Cetral SH E3	2		
Bearing, ID fan	K1		Dodge/Applied Ind. Tech.	SAF XT 524	grease seal 043553	Hsg H4S524FXT, Brg 22224CKJW33, Adptr SNW24 4-3/1	518-427-5800	BLOCK BLDG	2 Sets		?
Bearing, ID fan	K1		Dodge/Applied Ind. Tech.	SAF XT 524	grease seal 043553	Hsg H4S524FXT, Brg 22224CKJW33, Adptr SNW24 4-3/1	518-427-5800	CENT SH E5 & E7	2 SETS + 1 HSG		?
Bearing, Shale Rotary Feeder	K1		Dodge / Troy Belt	126196	4FB-SCM-215	2-15/16" shaft, 4 Bolt Med Duty, Insert #123364	518-272-4920	Central SH F14	2		
Bearing, Silo shale belt tail pulley	K1		SKF/Applied Ind. Tech.	YAR 211-200		2.0" ID	518-427-5800	Central SH F13	3		?
Bearing, Tire Fan	K1		Link Belt/Applied Ind Tech			PU347 = Non-Exp, PEU = Exp		Central SH E13	--		
Bearing, Top shale belt head pulley	K1		Dodge	126818	P2B-SCM-207	2 bolt base, 2-7/16" shaft	518-427-5800	Central SH E2	--		?
Bearing, Top shale belt tail pulley	K1		Dodge	126818	P2B-SCM-207	2-7/16" shaft, ball bearing, med. duty, pillow block	518-427-5800	Central SH E2	--		?
Bearing, Trunnion	K1		Cardish Machine			See Bearing, Pins (Below)		Bone Yd Box 1 & 2	1 New	2 Old	
Belt, "V", Baghouse blower, North & South	K1		Goodyear/Troy belt	5VX630		2 required for full change	518-272-4920		7		
Belt, "V", Barron Fan	K1		Goodyear/Troy belt	5VX1600		5 required for full change	518-272-4920		10	0	
Belt, "V", Clinker belt drive	K1		Goodyear/Troy belt	B70 (5L730)		2 required for full change	518-272-4920				
Belt, "V", Cooler fan (East)	K1		Goodyear/Troy belt	C144		6 required for full change	518-272-4920				
Belt, "V", Cooler fan (West)	K1		Goodyear/Troy belt	5VX1500		3 required for full change	518-272-4920		--		
Belt, Cog, Cooler Fan, (West)	K1		Gates/Kaman	GAT14M392020		One required	518-783-8114		1 in box		
Belt, "V", Heat exchanger fan	K1		Goodyear/Troy belt	B70 (5L730)		4 required for full change	518-272-4920				
Belt, "V", Heat exchanger Fan (New)	K1		Goodyear/Troy Belt	BX90		3 required for full change					
Belt, "V", Main kiln drive	K1		Goodyear/Troy belt	5VX1500		6 required for full change	518-272-4920		--		
Belt, "V", Multiclone blower (East)	K1		Goodyear/Troy belt	BX83		3 required for full change	518-272-4920				
Belt, "V", Multiclone blower (West)	K1		Goodyear/Troy belt	BX83		3 required for full change	518-272-4920				
Belt, "V", Shale belt, lower	K1		Goodyear/Troy belt	3VX670		2 required for full change	518-272-4920				
Belt, "V", Shale belt, top	K1		Goodyear/Troy belt	3VX1250		2 required for full change	518-272-4920				
Belt, "V", Shale silo heat blower	K1		Goodyear/Troy Belt	B42		2 required for full change	518-272-4920				
Belt, "V", Tire Fan (Replacement)	K1		Goodyear	5VX710		2 required for full change					

Belt, conveyor, Clinker belt	K1	Goodyear/Troy Belt	Wingfoot		24" 2-ply, 3/16" top, 1/16" btm, 220#/in, 290' long	518-272-4920			
Belt, conveyor, Shale, Lower belt	K1	Goodyear/Troy Belt	Wingfoot		24" 2-ply, 3/16" top, 1/16" btm, 220#/in, 195' long (183' ??)	518-272-4920			
Belt, conveyor, Shale, Top belt	K1	Goodyear/Troy Belt	Wingfoot		24" 2-ply, 3/16" top, 1/16" btm, 220#/in, 80' long	518-272-4920			
Belt, conveyor, Shale, Weigh Feeder	K1	Troy Belt			24" 2-ply, 1/8" top, 1/32" btm. 150#, 13'3" lg, 2" skirt/vulcani	518-272-4920	Pole Barn SH 3 MID	2	
Bolt, Bull Gear Section	K1	Cardish			2-3/4" x 15" Lg w/ 6-1/2" Center Section w/o Threads				
Bolt, tumbler	K1	Douglass	1-1/4"-7 x 11" UNC, SS		Two Nuts and Flats for each Bolt		Central	8	
Bushing Belt, Clinker, Drive Sheave	K1		1610 x 1-3/8						
Bushing Belt, Clinker, Driven Sheave	K1		2517 x 1-7/16						
Bushing, Belt, Shale (Lower), Drive Sheave	K1		SH x 1-3/8						
Bushing, Belt, Shale (Lower), Driven Sheave	K1		SH x 1-7/16						
Bushing, Belt, Shale (Upper), Drive Sheave	K1		1610 x 1-1/8						
Bushing, Belt, Shale (Upper), Driven Sheave	K1		SH x 1-7/16						
Bushing, Blower, Baghosue (N & S), Drive Sheave	K1		SDS x 1-5/8						
Bushing, Blower, Baghosue (N & S), Driven Sheave	K1		SK x 1-7/16						
Bushing, Blower, Multiclone (N & S), Drive Sheave	K1		SK x 1-7/8						
Bushing, Blower, Multiclone (N & S), Driven Sheave	K1		SD x 1-7/16						
Bushing, Cooler Drive Sprocket	K1	Martin/Applied Ind. Tech.	3020 x 2-1/8		2-1/8 Inch shaft	518-427-5800	Central SH L10	2	
Bushing, Fan, Barron, Drive Sheave	K1	Martin/Applied Ind. Tech.	SF x 2-7/8	QD TYPE	3/4" keyway	518-427-5800			
Bushing, Fan, Barron, Driven Sheave	K1	Martin/Applied Ind. Tech.	E x 2-11/16	QD TYPE	5/8" keyway	518-427-5800			
Bushing, Fan, Cooler (East), Drive Sheave	K1		F x 2-3/4						
Bushing, Fan, Cooler (East), Driven Sheave	K1		F x 2-15/16						
Bushing, Fan, Cooler (West), Drive Sheave	K1		SF x 2-3/8						
Bushing, Fan, Cooler (West), Driven Sheave	K1		SF x 2-7/16						
Bushing, Fan, Heatexchanger (Old), Drive Sheave	K1		SD x 1-7/8						
Bushing, Fan, Heatexchanger (Old), Driven Sheave	K1		SK x 2-7/16						
Bushing, Fan, Tire, Drive Sheave	K1		SF x 1-3/8						
Bushing, Fan, Tire, Driven Sheave	K1		SF x 2-15/16						
Bushing, Kiln Drive, Drive Sheave	K1		3535 x 3-3/8						
Bushing, Feeder, Rotary , Shale, Drive Sprocket	K1		2012 x 2				Central SH L7	2	
Bushing, Screw, Cooler (North), Drive Sprocket	K1	Dodge/Applied Ind. Tech.	2517 x 2		2-1/2" shaft	518-427-5800			
Bushing, Screw, Cooler (North), Driven Sprocket	K1		3020 x 2-7/16						
Bushing, Screw, Cooler (South), Drive Sprocket	K1		2517 x 2-1/2						
Bushing, Screw, Cooler (South), Driven Sprocket	K1	Martin/Applied Ind. Tech.	3020 x 2-7/16		2 Inch shaft	518-427-5800	Central SH L10	2	
Bushing, Valve, Rotary, Multiclone, Driven Sprocket	K1		2012 x 1-3/8						
Chain, #160, riveted, Kiln #1 cooler drive	K1	Applied Ind. Tech.			2" pitch, 13' long	518-427-5800			
Coalescer, K1 Airtek dryer	K1	AIRTEK/Rolfe Industries	JL0400-C		Replacement element P/N JE-C0400	518-383-2244			
Compressor, air, K1 Quincy	K1	Quincy/Rolfe Industries	QSI 500 ANA31A	94077		518-383-2244			
Coupling Grid, Kiln Drive	K1	Falk/Troy Belt	1180T		Use Seal Kit 1180T10				
Coupling Kit, Multiclone Rotary Valves	K1	Falk	4705632				Central SH L17	–	
Coupling, drive, K1	K1	Falk	1180T10		Recommended spacing is 1/4"				
Coupling, ID Fan (New Type)	K1	Lovejoy / K.J. Electric			Motor Hub Not Bored		Central SH L8	1 Set	
Coupling, Air Compressor, Quincey	K1	Omega/Applied	E30			518/427/5800	Central SH L17		
Coupling, K1 cooler drive	K1	Dodge #011107	PX 70		Para-flex; last changed on 11/1/97	518-427-5800			
Coupling, K1 ID fan (Alternate)	K1	Falk/Troy Belt	1100T10	COVER 1100T10	4.185" bore (fan) & 3.8725" bore (motor) T hubs, 1x1/2 KW	518-272-4920	Central SH E7		
Dryer, air, K1 air compressor, Airtek	K1	AIRTEK/Rolfe Industries	TW400	92E-5796		518-383-2244			
Filter bag, K1 baghouse	K1	BHA	2980302		Teflon design, 4.625" dia. x 144.75" long	800-821-2222	Pole Barn	100	0
Filter, air, K1 air compressor, QSI-500	K1	Quincy/Rolfe Industries	23458-2		NAPA P/N 6598, One required for operation	518-383-2244	Block House	2	
Filter, air, K1 multiclone blowers	K1	Stoddard Silencers	F8-109		No NAPA cross reference	847-223-8636	Block House	1	4.00
Filter, air K1 Camera	K1	Norgren/Hughes-Hitech	5351-04			716-759-8374			
Filter, particulate, K1 Airtek dryer	K1	AIRTEK/Rolfe Industries	JL0400-F			518-383-2244			
Frame, take-up, K1 clinker belt tail pulley	K1	Dodge, #089027	HD250x30-TUFR			518-427-5800			
Frame, take-up, K1 top shale belt tail	K1	Dodge,#039019	LD-45X18			518-427-5800			
Gear set, K1 main drive	K1	Traylor/FFE Minerals			Bull & Pinion, P.O. 970045; FFE Contract # 01-97-54307-7	800-523-9482			
Idler, return, K1 clinker belt	K1	Superior/Whitney & Son	615-RET-24		24" W, 5" can, 13 required	800-245-5472			
Idler, troughing, K1 clinker belt, head & tail	K1	Superior/Whitney & Son	615-20E-24		24"W x 20 deg., 5" can, 2 required	800-245-5472			
Idler, troughing, K1 clinker belt, mid span	K1	Superior/Whitney & Son	615-35E-24		24"W x 35 deg., 5" can, 31 required	800-245-5472			
Motor, hydraulic, K1 pony drive	K1	Permco	Unknown	Unknown	7500 series motor/pump, 6.06 ci disp., 2000 psi max. cont.	330-626-2801			
Oil, K1 main drive reducer	K1	Mobile/Congress Oil	Mobile 634		Requires approximately 40 gallons for change	518-584-3050			
Oil, K1, Air COmpressor, QSI- 500	K1	Quinsyn/Rolfe	Quinsyn		5 gal pails	518-383-2244			
Oil, K1 Thrust Buttons	K1	Castrol	AGMA-4-EP	P/N: 30439					
Bearing Pins, Trunnion Bearings	K1	Cardish Machine			1.5" OD x 4" Lg and 1.5" OD x 12" Lg., Carbon Steel		Central SH L29	--	
Pulley, drum, K1 clinker belt tail	K1	Applied Ind. Tech.			14" D x 26" L, 2-7/16" shaft, 46" long	518-427-5800			
Pulley, drum, K1 top shale belt head pulley	K1	Applied Ind. Tech.			16" D x 26" L; 2-7/16" shaft, 50" long, CL500 lagging	518-427-5800			
Pulley, drum, K1 top shale belt tail pulley	K1	Applied Ind. Tech.			16" D x 26" L, 2-7/16" shaft, 50" long	518-427-5800			
Pulley, Wing, Clinker Belt Tail	K1	Troy Belt			16" D, x 26" with Lagging & 2-7/16" x 48" AOL Shaft				
Reducer, Clinker Belt	K1	Dodge	TXT415AT						
Reducer, Main Kiln Drive	K1	FALK/Troy Belt	465A3-C	M.O. #93-066667-01	31.12:1 ratio, 150HP Service Rating, SF 2.07	518-272-4920			
Reducer, Cooler Screw (North)	K1	FALK/Applied Ind. Tech.	2040FZ3A56.43 143			518-427-5800			
Reducer, Multiclone Rotary Valve	K1	Falk Omnibox	1175WB2A60		60:1 Ratio		Central SH L21	–	
Reducer, Shale Feeder	K1	Dodge/Applied Ind. Tech	5APG57 7:1 / M65210	?????????	57.7:1 helical in-line reducer, 140TC frame	518-427-5800	Pole Barn	–	
Reducer, Shale Belt, Top	K1	Dodge/Applied Ind. Tech	TXT425AT	244527 YT	24.38:1 ratio, 21.8 HP @ 2072 RPM	518-427-5800	Pole Barn	–	
Scraper, T-Bar, Shale Belt, Lower	K1	Troy Belt	T-BAR 650				Central		1
Seal, K1 baghouse door	K1	BHA	3500898		1" x 1/4" blue closed cell silicone, last P.O. 969018				
Sheave, Baghouse Blower, North, Drive	K1	Martin/Applied Ind. Tech.	2 5V 8.00 SK		SK 1-7/8 bushing, 1-7/16" shaft, 2 groove, 1/2" sq. KW	518-427-5800			
Sheave, Baghouse Blower, North, Driven	K1	Martin/Applied Ind. Tech.	2 5V 5.2 SDS		SDS 1-7/16 bushing, 1-7/16" shaft, 2 groove	518-427-5800			
Sheave, Baghouse Blower, South, Drive	K1	Martin/Applied Ind. Tech.	2 5V 8.00 SK		SK 1-7/8 bushing, 1-7/16" shaft, 2 groove, 1/2" sq. KW	518-427-5800			
Sheave, Baghouse Blower, South, Driven	K1	Martin/Applied Ind. Tech.	2 5V 5.2 SDS		SDS 1-7/16 bushing, 1-7/16" shaft, 2 groove	518-427-5800			
Sheave, Barron Fan, Drive	K1	Martin/Applied Ind. Tech.	5-5V-750 SF		Uses bushing SF 2-7/8, 2-7/8" shaft, 5 groove	518-427-5800			
Sheave, Barron Fan, Driven	K1	Martin/Applied Ind. Tech.	5-5V-1400 E		Uses bushing E 2-11/16, 2-11/16" shaft, 5 groove	518-427-5800			

Sheave, Barron Fan, Driven (Experimental)	K1	Martin/Applied Ind. Tech.	5-5V-1400 E		Uses bushing E 2-7/8, 2-7/8" shaft, 5 groove	518-427-5800			
Sheave, Clinker Belt Drive	K1	Martin/Applied Ind. Tech.	2A5 6B5.4 1610	Alt. 2B5 6 SDS	Uses bushing 1610 x 1-3/8, 1-3/8" shaft, 2 groove	518-427-5800			
Sheave, Clinker Belt, Driven	K1	Martin/Applied Ind. Tech.	2A7 6B8.0 2517	Alt. 2B8 6SK	Uses bushing 2517 x 1-7/16, 1-7/16" shaft, 2 groove	518-427-5800			
Sheave, Cooler Fan, East, Drive	K1	Martin/Applied Ind. Tech	9C 11.0 E		Uses bushing E 2-3/8, 2-3/8" shaft, 6 groove 405U Fr Moto	518-427-5800			
Sheave, Cooler Fan, East, Driven	K1	Martin/Applied Ind. Tech	8C 11.0 E		Uses bushing E 2-15/16, 2-15/16" shaft, 6 groove	518-427-5800			
Sheave, Cooler Fan, West, Drive	K1	Martin/Applied Ind. Tech.	3 5V 10.30 SF		Uses bushing SF 2-3/8, 2-3/8" shaft, 3 groove	518-427-5800			
Sheave, Cooler Fan, West, Driven	K1	Martin/Applied Ind. Tech.	3 5V 11.30 SF		Uses bushing SF 2-7/16, 2-7/16" shaft, 3 groove	518-427-5800			
Sheave, Heat Exchanger Fan, Drive	K1	T.B. Wood's/Troy Belt	4A 6.0 B6.4 SD		Uses bushing SD 1-7/8, 1-7/8" shaft, 4 groove	518-272-4920			
Sheave, Heat Exchanger Fan, Driven	K1	Kaman	4A 7.6 B8.0 SK		Uses bushing SK 2-7/16, 2-7/16" shaft, 4 groove	518-783-8114			
Sheave, Kiln Drive (Motor Sheave)	K1	Dodge/Applied Ind Tech	P/N 111243	3535 x3-3/8 BUSH	11-1/4" OD, 3-3/8" bushing, 6 grooves, 5V Section				
Sheave, Multiclone Blowers, Drive	K1	Martin/Applied Ind. Tech.	3B 9.4 SK		Uses bushing SK 1-7/8, 1-7/8" shaft, 3 groove	518-427-5800			
Sheave, Multiclone Blowers, Driven	K1	Martin/Applied Ind. Tech.	3B 6.0 SD		Uses bushing SD 1-7/16, 1-7/16" shaft, 3 groove	518-427-5800			
Sheave, Shale Belt, Lower, Drive	K1	Martin/Applied Ind. Tech.	2 3V 4.12 SH		Uses bushing SH x 1-3/8", 1-3/8" shaft, 2 groove	518-427-5800			
Sheave, Shale Belt, Lower, Driven	K1	Martin/Applied Ind. Tech.	2 3V 6.0 SH		Uses bushing SH x 1-7/16", 1-7/16" shaft, 2 groove	518-427-5800			
Sheave, Shale Belt, Upper, Drive	K1	Martin/Applied Ind. Tech.	2 3V 3.35 1610		Uses bushing 1610 1-1/8", 1-1/8" shaft, 2 groove	518-427-5800			
Sheave, Shale Belt, Upper, Driven	K1	Martin/Applied Ind. Tech.	2 3V 10.6 SK		Uses bushing SK 1-7/16", 1-7/16" shaft, 2 groove	518-427-5800			
Sheave, Tire Fan, Drive (Replacement))	K1	Martin/Applied Ind Tech	2C 7.0 SF		Use bushing SF x 1-3/8", 1-3/8" shaft, 2 groove	518-427-5800			
Sheave, Tire Fan, Drive (Original)	K1	Martin/Applied Ind Tech	2 5V 670 SK		Use bushing SK 1-3/8", 1-3/8" shaft, 2 groove	518-427-5800			
Sheave, Tire Fan , Driven (Replacement))	K1	Applided	2 5V 1400 SF		Use Bushing SF x 2-15/16"				
Sprocket, Cooler Screw, North, Drive	K1	Martin/Applied Ind. Tech.	100BTB15H 2517		Uses Taperlock 2517, 2" shaft, 1/2" Keyway	518-427-5800	Central SH I8	3	
Sprocket, Cooler Screw, North, Driven	K1	Martin/Applied Ind. Tech.	100BTB32 3020		Uses Taperlock 3020, 2-7/16" shaft, 5/8" Keyway	518-427-5800	Central Floor	2	
Sprocket, Cooler Screw, South, Drive	K1	Martin/Applied Ind. Tech.	100BTB15H 2517		Uses Taperlock 2517, 2-1/2" shaft	518-427-5800	Central SH I8	–	
Sprocket, Cooler Screw, South, Driven	K1	Martin/Applied Ind. Tech.	100BTB32 3020		Uses Taperlock 3020, 2-7/16" shaft, 5/8" Keyway	518-427-5800	Central Floor	–	
Sprocket, Top Shale Rotary Feeder, Drive	K1	Martin/Applied/Troy Belt	80BTL17H 2012		Uses bushing 2012, 2" shaft	518-427-5800	Central SH I7	–	
Sprocket, Top Shale Rotary Feeder, Driven	K1	Martin/Applied/Troy Belt	80BS50 x 2-3/4		2-3/4" shaft w/ keyway	518-427-5800	Central Floor	2	
Thrust washer, brass, Kiln #1	K1	Cardish					Central SH L28	8	
Thrust washer, Phenolic, Kiln #2, 1 inch thick	K1	Cardish			Use 5/8 x 1-1/2" brass flat head screw		Central SH L34	5	0
Thrust washer, Phenolic, Kiln #2, 3/4 inch thick	K1	Cardish			Use 5/8 x 1-1/2" brass flat head screw		Central	0	8
Valve, ball, 1 "-150#, LGF control at kiln control room	K1	Conbraco/Collins	88-145-24		flanged, SS ball & stem, bodyseal RTFE, 4-7/8" AOL	800-876-5406	Central SH H13	2	
Valve, ball, 1 "-150#, LGF control at kiln control room	K1	Worcester/CPI	FZ5146TM150R6	Adapter MK50377	flanged, SS ball & stem, bodyseal RTFE,	518-785-8412	Central SH G3	2	
Valve, Ball, 1", 3 Piece, WFC0	K1	Watts	1C7450 M102 SS		1500 WOG 9250				
Valve, butterfly, K1 Multiclone Blower Discharge	K1	Bray/Uncle Sam	31/119		4" 11010 Base, 119 material code, CI body, DI disc, SS stem	518-235-1610			
Valve, butterfly, K1 recycle suction	K1	George Fischer/Uncle Sam	Type 367 PVC		d160 DN150 EPDM PN6, 6"	518-235-1610			
Valve, check, K1 air dryer	K1	Apollo/F. W. Webb	61-108-01		RTFE ball check, 2", 0 - 5 psi cracking pressure				
Bearing Pins, Trunnion Bearings	K2	Cardish Machine					Maint Supv. Locker	6	
Bearing, Barron fan	K2	Dodge / Applied Ind Tech			(2) Seals 043544, (1) brg 422003, (1)adptr 046356 (1) hous	518-427-5800	CENT SHF1 & 16	1 SET	+2 EXTRA HSG ?
Bearing, Clinker belt head pulley	K2	Seal Master/Applied	MP-47		2-15/16", 2-bolt pillow block; Seal Master P/N MP-47	518-427-5800			?
Bearing, Clinker belt head pulley, drive	K2	Cooper	01BCP215 EX		2-15/16", 2-bolt split roller bearing		Central SH E9	1	
Bearing, Clinker belt Tail pulley	K2	Dodge	126818	P2B-SCM-207	2-7/16", 2-bolt pillow block	518-427-5800	Central SH E2	–	?
Bearing, Belt, Top Shale, Tail Pulley	K2	Dodge	126818	P2B-SCM-207	2-7/16", 2-bolt pillow block				
Bearing, Cooler, East fan	K2	Link Belt/Applied Ind Tech	PU347 & PEU347		PU347 = Non-Exp, PEU = Exp		Central SH E13	–	
Bearing, Cooler, West fan, expansion	K2	Dodge	037618	P4B-515-TAF-207-RE	4 bolt base, 2-7/16" shaft, opposite drive end	518-427-5800	Central SH E8	1	
Bearing, Cooler, West fan, non expansion	K2	Dodge	037604	P4B-515-TAF-207-R	4 bolt base, 2-7/16" shaft, drive side	518-427-5800	Central SH E8	1	
Bearing, Heat exchanger fan	K2	Link Belt/Applied Ind Tech	PU339 & PEU339		PU Fixed, PEU Expansion, 2 Bolt, 2-7/16" shaft	518-427-5800	Central SH E3	–	
Bearing, Heat Exchanger Fan (New)	K2	SKF	SYR 2-15/16 H		Non-Expansion (Sheave End) Bearing		Cetral SH E3	2	
Bearing, Heat Exchanger Fan (New)	K2	SKF	SYR 2-15/16		Expansion (Fan End) Bearing		Cetral SH E3	2	
Bearing, ID fan	K2	Dodge/Applied Ind. Tech.	SAF XT 524	grease seal 043553	Hsg.H4S524FXT, Brg.22224CKJW33, Adptr SNW24 4-3/1	518-427-5800	–	–	?
Bearing, Middle Shale Belt Head Pulley	K2	Dodge/Troy Belt/Applied	126818	P2B-SCM-207	2-7/16" shaft, ball bearing, med. duty, pillow block	518-272-4920	Central SH E2	–	?
Bearing, Nose ring fan	K2	Dodge	023009	P2B-E-115R	2 bolt base, 1-15/16" shaft	518-427-5800			?
Bearing, Pinion Shaft	K2	Dodge	422029	BRG NO. 22244KC3	Adapt Assy: 043627 7-1/2", LER Seal: 042539 7-1/2"		Pole Barn	2 BRG/2 ADAP	3 seals ?
Bearing, Pinion shaft, spher. roller	K2	Torrington	22244YMW33		Each bearing uses (2) SKF seals P/N LER 167				?
Bearing, Primary air fan	K2	Dodge	126814	P2B-SCM-115	1-15/16" shaft; Seal Master P/N MP 31	518-427-5800	Central SH E9	–	
Bearing, Shale Rotary Feeder	K2	Dodge / Troy Belt	126195	4FB-SCM-215	2-15/16" shaft, 4 Bolt Med Duty, Insert #123364	518-272-4920	Central SH F14	–	
Bearing, Tire Fan, Fan End	K2	Dodge	044618	P2B-S2-115RE	1-15/16" Shaft, Expansion	518-427-5800			?
Bearing, Tire Fan, Sheave End	K2	Dodge	044618	P2B-S2-115R	1-15/16" Shaft, Non-Expansion	518-427-5800			?
Bearing, Trunnion	K2	Cardish Machine					Bone Yd Box 1 & 2	5 New	10 Old
Belt, "V", Burner Floor Exhaust Fan	K2		A71		2 required for full change				
Belt, "V", Baghouse blower (North)	K2	Goodyear/Troy belt	5VX630		3 required for full change	518-272-4920			
Belt, "V", Baghouse blower (South)	K2	Goodyear/Troy belt	5VX630		2 required for full change	518-272-4920		–	
Belt, "V", Baron Fan	K2	Goodyear/Troy belt	5VX1500		5 required for full change	518-272-4920		–	
Belt, "V", Clinker Belt	K2	Goodyear/Troy Belt	B70		2 required for full change				
Belt, "V", Cooler Fan (East)	K2	Goodyear/Troy Belt	C136		6 required for full change				
Belt, "V", Cooler Fan (West)	K2	Goodyear/Troy belt	BX105		3 required for full change	518-272-4920			
Belt, "V", Heat exchanger fan (New)	K2	Goodyear/Troy belt	BX71		5 required for full change	518-272-4920			
Belt, "V", Heat exchanger fan (Old)	K2	Goodyear/Troy belt	B70 (5L730)		4 required for full change	518-272-4920			
Belt, "V", Main kiln drive	K2	Goodyear/Troy belt	5VX1700		6 required for full change	518-272-4920			
Belt, "V", Multiclone blower (East)	K2	Goodyear/Troy belt	5VX630		2 required for full change	518-272-4920		–	
Belt, "V", Multiclone blower (West)	K2	Goodyear/Troy belt	5VX630		2 required for full change	518-272-4920		–	
Belt, "V", Nose ring fan	K2	Goodyear/Troy belt	B81		4 required for full change	518-272-4920			
Belt, "V", Tire fan	K2	Goodyear/Troy belt	B70		3 required for full change	518-272-4920			
Belt, "V", Shale Belt, Lower	K2	Goodyear/Troy Belt	3VX710		2 required for full change			–	
Belt, "V", Shale Belt, Middle	K2	Goodyear/Troy belt	3VX710		2 required for full change	518-272-4920			
Belt, "V", Shale Belt, Top	K2	Goodyear/Troy belt	5VX630		2 required for full change	518-272-4920			
Belt, conveyor, Clinker belt	K2	Goodyear/Troy Belt	Wingfoot		18" 2-ply, 3/16" top, 1/16" btm, 220#/in, 290' long	518-272-4920			
Belt, conveyor, Shale belt, middle	K2	Goodyear/Troy Belt	Wingfoot		24" 2-ply, 3/16" top, 1/16" btm, 220#/in, 88' long	518-272-4920			
Belt, conveyor, Shale belt, top	K2	Goodyear/Troy Belt	Wingfoot		24" 2-ply, 3/16" top, 1/16" btm, 220#/in, 100' long	518-272-4920			
Bolt, Thrust Button Base	K2	Douglass	1-8 x 9" Cap Screw Grade 8						
Bolt, tumbler	K2	Douglass	1"-7 x 11" UNC, SS		Two Nuts and Flats for each Bolt		Central	8	
Bushing Belt, Clinker, Drive Sheave	K2		2517 x 1-3/8						

An up-to-date list is available from the maintenance manager.

Bushing Belt, Clinker, Driven Sheave	K2		2517 x 1-15/16							
Bushing, Belt, Shale (Lower), Drive Sheave	K2		1610 x 1-3/8							
Bushing, Belt, Shale (Lower), Driven Sheave	K2		2517 x 1-7/16							
Bushing, Belt, Shale (Middle), Drive Sheave	K2		SH x 1-1/8							
Bushing, Belt, Shale (Middle), Driven Sheave	K2		SK x 1-7/16							
Bushing, Belt, Shale (Upper), Drive Sheave	K2		1610 x 1-1/8							
Bushing, Belt, Shale (Upper), Driven Sheave	K2		1610 x 1-7/16							
Bushing, Blower, Baghosue (N & S), Drive Sheave	K2		SDS x 1-5/8							
Bushing, Blower, Baghosue (N & S), Driven Sheave	K2		SK x 1-7/16							
Bushing, Blower, Multiclone (E & W), Drive Sheave	K2		SK x 1-7/8							
Bushing, Blower, Multiclone (E & W), Driven Sheave	K2		SDS x 1-7/16							
Bushing, Cooler Drive Sprocket	K2	Martin/Applied Ind. Tech.	3020 x 2-1/8		2-1/8 inch shaft	518-427-5800	Central SH L10	2		
Bushing, Fan, Barron, Drive Sheave	K2	Martin/Applied Ind. Tech.	3020 x 2-7/8	QD TYPE	3/4" keyway	518-427-5800				
Bushing, Fan, Barron, Driven Sheave	K2	Martin/Applied Ind. Tech.	????	QD TYPE	5/8" keyway	518-427-5800				
Bushing, Fan, Cooler (East), Drive Sheave	K2		3030 x 2-3/8							
Bushing, Fan, Cooler (East), Driven Sheave	K2		3030 x 2-15/16							
Bushing, Fan, Cooler (West), Drive Sheave	K2		2517 x 2-3/8							
Bushing, Fan, Cooler (West), Driven Sheave	K2		SK x 2-7/16							
Bushing, Fan, Heatexchanger (Old), Drive Sheave	K2		SD x 1-7/8							
Bushing, Fan, Heatexchanger (Old), Driven Sheave	K2		SK x 2-7/16							
Bushing, Fan, Nose Ring, Drive Sheave	K2		2517 x 1-7/8							
Bushing, Fan, Nose Ring, Driven Sheave	K2		2517 x 1-15/16							
Bushing, Fan, Tire, Drive Sheave	K2		SK x 1-5/8							
Bushing, Fan, Tire, Driven Sheave	K2		SK x 1-15/16							
Bushing, Kiln Drive, Motor Sheave	K2	Troy Belt	F x 3-3/8							
Bushing, Kiln Drive, Reducer Sheave	K2	Troy Belt	J x 4							
Bushing, Rotary Feeders, Shale, Drive Sprocket	K2		2012 x 2				Central SH L7	--		
Bushing, Screw, Cooler (North), Drive Sprocket	K2	Dodge/Applied Ind. Tech.	2517 x 2							
Bushing, Screw, Cooler (North), Driven Sprocket	K2		3020 x 2-7/16							
Bushing, Screw, Cooler (South), Drive Sprocket	K2		2517 x 2							
Bushing, Screw, Cooler (South), Driven Sprocket	K2	Martin/Applied Ind. Tech.	3020 x 2-7/16							
Coalescer, K2 Airtek dryer	K2	AIRTEK/Rolfe Industries	JL0600-C		Replacement element P/N JE-C0600	518-383-2244				
Compressor, air, K2 Ingersoll-Rand	K2	Ingersoll-Rand	SSR-EP100	D9186U89B						
Compressor, air, K2 Quincy	K2	Quincy/Rolfe Industries	QSI 490 ANN3	30987		518-383-2244				
Coupling Grid, Cooler Screw, (North & South)	K2	Falk/Troy Belt/Applied	1030T Grid / p/n 0762811				Central SH L			
Coupling Kit, Multiclone Rotary Valves	K2	Falk	4705632				Central SH L17	--		
Coupling, Cooler Screw (North)	K2	Falk/Troy Belt / Applied	1040T10		7/8" bore motor side, 1-3/8" reducer side		Central SH L17	1 complete set		
Coupling, Cooler Screw (South)	K2	Falk/Troy Belt / Applied	1040T10		7/8" bore motor side, 1-3/8" reducer side		Central SH L17	--		
Coupling, Dust Silo 2 Rot Feeder (West)	K2	Falk/Applied	4705615		For 1175 Omnibox Reducer					
Coupling, Dust Silo 3 Rot Feeder (East)	K2	Falk/Applied	4705615		For 1175 Omnibox Reducer					
Coupling, Air Compressor, Quincey	K2	Omega/Applied	E30			518/427/5800	Central SH L17			
Coupling, K2 Air Compressor, Quincey	K2	Quincy/Rolfe Industries	121824		Seal for 3" Pipe Coupling, piping between compressor & se	518-383-2244				
Coupling, K2 cooler drive	K2	Dodge/Applied Ind. Tech.	1040T10		1-3/8" & 1-5/8" 1040T hubs	518-272-4920				
Coupling, K2 top shale belt, head pulley	K2				7/8" dia. motor shaft, 2.0" dia. reducer shaft					
Coupling, Multiclone Rot Feeder	K2	Falk/Applied	4705615		For 1175 Omnibox Reducer					
Dryer, air, K2 air compressor, Airtek	K2	AIRTEK/Rolfe Industries	TW500	931-6188		518-383-2244				
Dryer, air, K2 air compressor, Deltech	K2	Deltech/A/C Engineering	PS370-4SP	4589042739		518-383-2244				
Filter bag, K2 baghouse	K2	BHA	2981689			800-821-2222	Block Building	72+	0	
Filter, air, Camera Purge Air	K2	ARO/Shako	25361-010		metal bowl guard, 3/4" female NPT					
Filter, air, Camera	K2	ARO/Shako	F25241-110							
Filter, air, K2 camera	K2	Deltech/Rolfe Ind.	811		Requires filter element No. 811E	518-383-2244				
Filter, air, K2 I/R air compressor	K2	Ingersoll-Rand/A/C Eng.	39708466		2 required. NAPA P/N 6369		Block House	4	0	
Filter, air, K2 multiclone blowers	K2	NAPA	6343			518-782-7180	--	--		
Filter, air, secondary, K2 air compressor, QSI-490	K2	Quincy/Rolfe Industries	23458-3		Napa P/N 6795	518-383-2244	Block House	2		
Filter, air, secondary, K2 air compressor, QSI-490	K2	Quincy/Rolfe Industries	120382		NAPA P/N 6796	518-383-2244	Block House	2		
Filter, particulate, K2 Airtek dryer	K2	AIRTEK/Rolfe Industries	JL0600-F		Replacement element P/N JE-F0600	518-383-2244				
Idler, return, K2 clinker belt	K2	SA/Applied Ind. Tech.	215-18-91-0200		18"W, 5" can, req's 2 bracket P/N MD IDL 195700	518-427-5800				
Idler, troughing, K2 clinker belt	K2	SA/Applied/LB Smith	205-18-B0-0120		18"W x 35 deg., 5" can	518-427-5800				
Idler, troughing, K2 middle shale belt	K2	FMC/Troy Belt	C3528-24		24"W x 35 deg., 5" can	518-272-4920				
Idler, troughing, K2 top shale belt	K2	FMC/Troy Belt	C3528-24		24"W x 35 deg., 5" can	518-272-4920				
Kit, rebuild, Airtek dryer exhaust valve	K2	Aquamatic/Rolfe Ind.	AV4-RA			518-383-2244				
Kit, rebuild, Airtek dryer inlet valve	K2	Aquamatic/Rolfe Ind.	AV5-RA			518-383-2244				
Kit, rebuild, Deltech dryer switching valve	K2	Deltech/Rolfe Industries	S4DE			518-383-2244				
Packing, Kiln Trunnions	K2		Style 1760		1-1/8" PTFE/Graphite. Approx 50" per seal required					
Pulley, drum, K2 Midlle Shale Belt Head Pulley	K2	Troy Belting			16" D x 26" L, 2-7/16" shaft,lagged	518-272-4920				
Rebuild Kit, Air Dryer, Inlet Valve, Aitech	K2	Airtech/Rolfe Ind	TP7720							
Reducer, K2 cooler drive	K2	Dodge/Applied Ind. Tech.	DCR-2	299031 RY	1-3/8" input shaft	518-272-4920				
Reducer, Cooler Screw, North	K2	Dodge/Applied/Troy Belt	2040F23A-57.62:1		Uses a 145T Motor Bracket					
Reducer, Cooler Screw, South	K2	Dodge/Applied/Troy Belt	2040F23A-57.62:1		Uses a 145T Motor Bracket					
Reducer, K2 Middle Shale Belt	K2	Dodge/TXT425AT	TXT425AT							
Reducer, K2 Top Shale Belt	K2	Dodge/TXT425AT	TXT425AT							
Reducer, Multiclone Rotary Valve	K2	Falk Omnibox	1175WB2A60		60:1 Ratio		Central SH L21	--		
Reducer, K2 shale feeder, top shale belts	K2	Dodge/Applied Ind. Tech.	5APG57.7:1 / M85210	5069492001DA	57.7:1 helical in-line reducer, 140TC frame	518-427-5800	Pole Barn	--		
Screw, Flat Head, Brass, Trunnion Thrust Plates	K2	Douglass	5/8-11 X 1-1/2" Slotted	82 Degree Shoulder			Central SH L23	36		
Seal, bearing, K2 pinion shaft	K2	SKF	LER167		Used with Spher. roller bearing 22244YMW33					
Seal, oil, K2 trunnion	K2	Garlock/Applied Ind Tech	23 x 5116		16.0 x 18.0 x 0.750, 25003-5116	518-272-4920	Central SH L23	7		
Separator, moisture, K2 camera	K2	ARO/Shako	25351-020			518-785-8597				
Separator, oil, primary, K2 a/c, QSI-490	K2	Quincy/Rolfe Industries	22705-3		Also requires secondary separator P/N 122117-3	518-383-2244	Tent Garage	2 each	0	
Separator, oil, secondary, K2 a/c, QSI-490	K2	Quincy/Rolfe Industries	122117-3		Also requires primary separator P/N 22705-3	518-383-2244	Tent Garage	2		

Sheave, Baghouse Blower, North, Drive	K2	Martin/Applied Ind. Tech	2.5V 5.9 SDS	SDS 1-5/8 bushing, 1-5/8" shaft, 2 groove	518-427-5800			
Sheave, Baghouse Blower, North, Driven	K2	Martin/Applied Ind. Tech	2.5V 7.1 SK	SK 1-7/16 bushing, 1-7/16" shaft, 2 groove, 3/8" sq. KW	518-427-5800			
Sheave, Baghouse Blower, South, Drive	K2	Martin/Applied Ind. Tech	2.5V 5.9 SDS	SDS 1-5/8 bushing, 1-5/8" shaft, 2 groove	518-427-5800			
Sheave, Baghouse Blower, South, Driven	K2	Martin/Applied Ind. Tech	2.5V 7.1 SK	SK 1-7/16 bushing, 1-7/16" shaft, 2 groove, 3/8" sq. KW	518-427-5800			
Sheave, Barron Fan, Drive	**K2**	**Dodge/Applied Ind Tech**	**5/5V 9.25 3020**	**Use bushing 3020 X 2-7/8. 5 Grooves**				
Sheave, Barron Fan, Driven	**K2**	**Martin/Applied Ind. Tech.**	**5-5V-1400**		**518-427-5800**			
Sheave, Clinker Belt, Drive	K2	Martin/Applied Ind. Tech	2B 7.0 2517	2517 1-3/8" bushing, 1-3/8" shaft, 2 groove	518-427-5800			
Sheave, Clinker Belt, Driven	K2	Martin/Applied Ind. Tech	2B 7.0 2517	2517 1-15/16" bushing, 1-15/16" shaft, 2 groove	518-427-5800			
Sheave, Cooler Fan, East, Drive	K2		6C 11.0 3030	Use bushing 3030 2-3/8				
Sheave, Cooler Fan, East, Driven	K2		6C 11.0 3030	Use bushing 3030 2-15/16				
Sheave, Cooler Fan, West, Drive	**K2**	**Dodge/Applied / Troy Belt**	**3 B 9.4 2517**	**Sheave OD = 9-5/8", 3 groove, B section, 2-3/8" bore**	**518-427-5800**			
Sheave, Cooler Fan, West, Driven	**K2**	**Dodge/Applied / Troy Belt**		**Sh. OD = 11-1/2", 3 groove, B sect, SK 2-7/16 bushing**	**518-427-5800**			
Sheave, Heat Exchanger Fan, Drive	K2	T.B. Woods/Troy Belt	4A 6.0 B6.4 SD	Uses bushing SD 1-7/8, 1-7/8" shaft, 4 groove	518-272-4920			
Sheave, Heat Exchanger Fan, Driven	K2	Kaman	4A 7.6 B8.0 SK	Uses bushing SK 2-7/16, 2-7/16" shaft, 4 groove	518-783-8114			
Sheave, Kiln Drive (Motor Sheave)	K2	Troy Belt	5V15.00x6-F	Use bushing Fx3-3/8, 3-3/8 motor shaft, 6 groove	518-272-4920			
Sheave, Kiln Driven (Gearbox Sheave)	K2	Troy Belt	5V23.6x6-J	Use bushing JK4, 4" reducer shaft, 6 groove	518-272-4920			
Sheave, Multiclone Blower, East, Drive	K2		2.5V 8.00 SK	Use Bushing SK x 1-7/8"				
Sheave, Multiclone Blower, East, Driven	K2		2.5V 5.20 SDS	Use Bushing SDS x 1-7/16"				
Sheave, Multiclone Blower, West, Drive	K2		2.5V 8.00 SK	Use Bushing SK x 1-7/8"				
Sheave, Multiclone Blower, West, Driven	K2		2.5V 5.20 SDS	Use Bushing SDS x 1-7/16"				
Sheave, Nose Ring Fan, Drive	K2	Martin/Applied Ind. Tech	4B 8.0 2517	8-5/16" OD Uses TaperLock 2517 1-7/8" shaft, 4 groove	518-427-5800			
Sheave, Nose Ring Fan, Driven	K2	Martin/Applied Ind. Tech	4 A4.6 B5.0 2517	Uses TaperLock 2517 1-15/16" shaft, 4 groove	518-427-5800			
Sheave, Shale Belt, Lower, Drive	K2		2.3V 5.6 1610	Uses bushing 1610 1-3/8", 2 grooves				
Sheave, Shale Belt, Lower, Driven	K2		2.3V 8.0 2517	Uses bushing 2517 1-7/16" 2 grooves				
Sheave, Shale Belt, Middle, Drive	K2		2.3V 3.65 SH	Use Bushing SH x 1-1/8"				
Sheave, Shale Belt, Middle, Driven	K2		2.3V 10.60 SK	Use Bushing SK x 1-7/16"				
Sheave, Shale Belt, Upper, Drive	K2	Martin/Applied Ind. Tech	2.3V 3.35 1610	Uses bushing 1610, 1-1/8" shaft, 2 groove	518-427-5800			
Sheave, Shale Belt, Upper, Driven	K2	Martin/Applied Ind. Tech	2.3V 4.75 1610	Uses bushing 1610, 1-7/16" shaft, 2 groove	518-427-5800			
Sheave, Tire Fan, Drive	K2	T.B. Woods/Troy Belt	3B 9.4 SK	9-3/4" OD Uses bushing SK 1-5/8, 3 groove	518-272-4920			
Sheave, Tire Fan, Driven	K2	T.B. Woods/Troy Belt	3B 9.4 SK	9-3/4" OD Uses bushing SK 1-15/16, 3 groove	518-272-4920			
Sight Glass, K2 Trunion Oil Level	K2	GITS Mfg / Applied Ind Tech	15333 (1500-333)	Glass only P/N 3063 519, Gasket only P/N 4007 409004	518-427-5800	Central SH J3	6	0
Sprocket, Cooler Screw, North, Drive	K2	Martin/Applied Ind. Tech.	100BTB15H 2517	Uses Taperlock 2517, 2" shaft, 1/2" Keyway	518-427-5800	Central SH I8	–	
Sprocket, Cooler Screw, South, Drive	K2	Martin/Applied Ind. Tech.	100BTB15H 2517	Uses Taperlock 2517, 2" shaft, 1/2" Keyway	518-427-5800	Central SH I8	–	
Sprocket, Top Shale Rotary Feeder, Drive	K2	Martin/Applied/Troy Belt	80BTL17H 2012	Uses bushing 2012, 2" shaft	518-427-5800	Central SH I7	–	
Sprocket, Top Shale Rotary Feeder, Driven	K2	Martin/Applied/Troy Belt	80BS50 x 2-3/4	2-3/4" shaft w/ keyway	518-427-5800	Central Floor	–	
Valve, Ball, 1", LGF Control Valves	K2	Apollo/Collins	ODEC21300 / 7010501	Bronze Valve w/SS Ball		Central Rotobin		
Valve, Ball, 1-1/2", Caustic Supply to Scrubber	K2	Worcester-CPI	1-1/2FZ514GTM150R6	TFE Seal 316 Trim CWP 285				
Valve, butterfly, K2 recycle suction	**K2**	**Hayward/Uncle Sam**	**HAYW BY140600EL**	**EPDM liner & seal, polypropylene disc**	**518-235-1610**			
Valve, Check, Airtek Dryer	**K2**	**CDI/Rolfe Ind**		**1 Inch**				
Valve, diaphragm, Airtek dryer	**K2**	**Airtek/Rolfe Industries**	**TP7515**	**Tower exhaust valve**	**518-383-2244**			
Valve, Diaphragm, Exhaust, Airtek Dryer	**K2**	**Aquamatic/Rolfe Ind**	**1070065**	**M/N: VAVE-0032090000**				
Valve, shuttle, Airtek dryer	**K2**	**Airtek/Rolfe Industries**	**S4DE09**					
Regulator, Propane, Lab Burner	LAB	CONCOA/AWESCO	806 7014	MAPP/Propane CFH 130		Office Cabinet #2		
Actuator, electric, acid & caustic	**WW**	**Jordan Controls/ProQuip**	**SM-1010A-2-0-0-0-Z**		**201-797-7800**			
Ball, check, iron pump	**WW**	**Warren Rupp / Rolfe Ind.**	**050-008-360**	**4 required on SandPIPER SB1-A Type 4, Buna N**	**518-383-2244**			
Ball, check, sludge pump	**WW**	**Warren Rupp / Rolfe Ind.**	**050-017-365**	**4 required on SandPIPER EB2-M, neoprene rubber**	**518-383-2244**			
Bearing, Effluent pump, inboard	WW	SKF/Applied Ind Tech	6207 2RSJEM	One required	518-427-5800	Central SH F3	–	
Bearing, Effluent pump, outboard	WW	SKF/Applied Ind Tech	5306 A/C3	One required	518-427-5800	Central SH F2	–	
Belt, Cog, Polymer pump	**WW**	**Goodyear/Troy Belt**	**180XL037**	**(1) required for operation**	**518-272-4920**			
Belt, "V", Air Compressor	**WW**	**Goodyear/Troy Belt**	**B118**	**3 required for full change**	**518-272-4920**			
Bleach, Effluent treatment	**WW**	**Surpass Chemical Co.**		**55 Gallons, 550 pounds; 12.5% Sodium Hypochlorite**	**518-434-8101**			
Casing, impeller, WW effluent pump	**WW**	**Durco/Rolfe Industries**	**KD100 DCI**	**Material: ductile/cast iron, for Mark III Grp I 1K3x1.5-82**	**518-383-2244**			
Casing, impeller, WW OFC pump	**WW**	**Durco/Rolfe Industries**	**KB100**	**Material: CD4M, for 1K1.5x1-8 ANSI #AA**	**518-383-2244**			
Chamber, mixing, WW polymer	**WW**	**Stranco**	**2340101**	**Small frame Multi-Zone**	**800-882-6466**			
Compressor, air, WW Quincy	**WW**	**Quincy/Rolfe Industries**	**QR-25**	**Waste Water air compressor**	**518-383-2244**			
Coupling Insert, OFC pump	WW	Woods/Troy Belt	7JE			Central SH L9	4	
Coupling, WW effluent pump	**WW**	**Rexnord/Applied Ind Tech**	**See comments**	**Element ES4R, Hubs 4SHSB STD 7/8" & 4SHSB STD 1-5**	**518-427-5800**			
Coupling, WW OFC pump	**WW**	**Wood's/Kaman**	**mp shaft, 1-5/8" motor shaft**	**(1) 7JE element, (2) 7SC35 flanges, (1) 7SCH78 & (1) 7SC**	**518-783-8114**			
Cover, rear, WW OFC pump	**WW**	**Durco/Rolfe Industries**	**KA106D**	**Material: CD4M, for 1K1.5x1-8 ANSI #AA**	**518-383-2244**			
Diaphragm, neoprene, WW sludge pump	**WW**	**Warren Rupp / Rolfe Ind.**	**EB2-M**	**(2) required on SandPIPER EB-2-M diaphragm pump**	**518-383-2244**			
Diaphragm, WW iron pump	**WW**	**Warren Rupp / Rolfe Ind.**	**286-008-360**	**(2) req'd on SandPIPER SB1-A Type 4 pump, Buna N**	**518-383-2244**			
Filter, Air, Air Compressor, Quinsey QT-25	**WW**	**Quincy/Rolfe Industries**	**110377E100**	**2 required**	**518-383-2244**			
Filter, sock, WW sock filters, 100 mesh	**WW**	**Ronningen-Petter**	**6100PYL04100**	**7CFAB 1536 100 MESH PYL-SPARE**	**616 323 1313**			
Filter, WW 1" airline, 5 micron, manual drain	**WW**	**Wilkerson/Air Comp Eng**	**F30-08-M00**	**WW Quincy QTH-25-120 a/c; 325 scfm @ 100psi**	**518-371-4401**			
Filter/Regulator, WW, Iron Sulfate Pump	WW	Warren-Rupp/Rolfe	020-050-000	1/2 INCH 0/125 MAX PSI. Repl Elem: P/N 020 050 004	518-383-2244	Central	2	
Gasket, gland, WW Effluent pump	**WW**	**Durco/Rolfe Industries**	**1K190G**	**Teflon gasket**	**518-383-2244**			
Gasket, gland, WW EQ pump	**WW**	**Durco/Rolfe Industries**	**1K190G**	**Teflon gasket**	**518-383-2244**			
Gasket, gland, WW OFC pump	**WW**	**Durco/Rolfe Industries**	**1K190G**	**Teflon gasket**	**518-383-2244**			
Gasket, impeller, QW clean water pump	**WW**	**Durco/Rolfe Industries**	**1K104**	**For Mark III 1K3x1.5RV-62**	**518-383-2244**			
Gasket, impeller, WW EQ pump	**WW**	**Durco/Rolfe Industries**	**1K104TFR**	**Used on Durco Mark III process pump, 1-3/8" shaft**	**518-383-2244**			
Gasket, impeller, WW OFC pump	**WW**	**Durco/Rolfe Industries**	**1K104**		**518-383-2244**			
Gasket, rear cover, QW clean water pump	**WW**	**Durco/Rolfe Industries**	**AC107**	**For Mark III 1K3x1.5RV-62**	**518-383-2244**			
Gasket, rear cover, WW OFC pump	**WW**	**Durco/Rolfe Industries**	**AC107**	**Teflon**	**518-383-2244**			
Impeller, QW clean water pump	**WW**	**Durco/Rolfe Industries**	**KC103RV**	**Material: 316 SS, for Mark III 1K3x1.5RV-62; 6.25" trim**	**518-383-2244**			
Impeller, WW EQ pump	**WW**	**Durco/Rolfe Industries**	**KA103RV**	**Material: CD4M, for Mark III 1K1.5x1-62; 3-7/8" trim**	**518-383-2244**			
Impeller, WW EQ pump (experimental 10/99)	**WW**	**Durco/Rolfe Industries**	**KA103RV**	**Material: CD4M, for Mark III 1K1.5x1-62; 4-1/2" trim**	**518-383-2244**			
Impeller, WW OFC pump	**WW**	**Durco/Rolfe Industries**		**Material: CD4M, for 1K1.5x1-8 ANSI #AA; 6-3/8" trim**	**518-383-2244**			
Kit, spare parts, WW bleach pump, large	**WW**	**LMI/Rolfe Industries**	**SP-44**	**Incl: diaphragm, valve balls, seal rings & check spring**	**518-383-2244**			
Kit, spare parts, WW bleach pump, small	**WW**	**LMI/Rolfe Industries**	**SP-U1**	**Incl: diaphragm, valve balls, seal rings & check spring**	**518-383-2244**			

Mixer, pneumatic, WW iron sulfate	WW
Mixer, WW EQ tank	WW
Mixer, WW EQ tank	WW
Mixer, WW overflow collection tank	WW
Mixer, WW sludge tank	WW
O-ring, WW pumps Bearing Carriers	WW
Pressure Switch / unloader, WW Quincey air comp	WW
Priming accessory kit, WW polymer mixer	WW
Pulley, WW polymer mixer, drive	WW
Pulley, WW polymer mixer, driven	WW
Pump, Acid Metering	WW
Pump, Bleach Metering, Backup (large)	WW
Pump, Bleach Metering, Primary (small)	WW
Pump, Bleach Metering, Primary (small)	WW
Pump, Caustic Metering	WW
Pump, Effluent	WW
Pump, Equalization	WW
Pump, Iron Sulfate	WW
Pump, Over Flow Collection	WW
Pump, QW Clean Water	WW
Pump,Sludge	WW
Rebuild kit, WW iron pump pilot valve	WW
Rebuild kit, WW sludge pump air end	WW
Rebuild kit, WW sludge pump pilot valve	WW
Regulator, pressure, WW air compressor	WW
Seal, WW Eff. pump	WW
Seal, WW EQ pump	WW
Seal, WW overflow collection pump	WW
Seat, ball check, WW iron pump	WW
Seat, ball check, WW sludge pump	WW
Sight tube, WW HCL tank	WW
Valve, 4 function, WW small bleach pump	WW
Valve, ball, WW Effluent	WW
Valve, pressure release, WW filter press	WW
Valve, selector, WW Filter Press	WW
Tubing, PVC, 3/4"	WWTP
Tubing, PVC, 1"	WWTP

MixMor	DA-2
Philadelphia Mixers	PV-4 PTO
Philadelphia Mixers	PV-4 PTO
Philadelphia Mixers	PV-4 PTO
Philadelphia Mixers	PV-4 PTO
Durco/Rolfe Industries	1Y201B
Square D/Grainger	9013FHG52J59X
Stranco	K2343002
Stranco	7071001
Stranco	7071201
Durco/Rolfe Industries	E1-16138-68A54
LMI/Rolfe Indutries	L122-44
LMI/Rolfe Indutries	A181-95S
LMI/Rolfe Indutries	A181-95S
Durco/Rolfe Industries	E1-16076-62A34
Durco/Rolfe Industries	1K3x1.5-62RV/76
Durco/Rolfe Industries	1K1.5X1-62 RV/37
Warren Rupp / Rolfe Ind.	SB1-A Type SB-4-A
Durco/Rolfe Industries	1K1.5X1-82 RV/62
Durco/Rolfe Industries	1K3x1.5-62RV
Warren Rupp / Rolfe Ind.	EB2-M
Warren Rupp / Rolfe Ind.	031-060-000
Warren Rupp / Rolfe Ind.	476-100-000
Warren Rupp / Rolfe Ind.	031-055-000
Wilkerson/ A/C Eng.	WK-R30-08-G00
Frederick Seals	$MEC105466
Frederick Seals	$MEC122543
Frederick Seals	$MEC104500A
Warren Rupp / Rolfe Ind.	722-026-580
Warren Rupp / Rolfe Ind.	722-040-365
McMaster-Carr	5233K71
LMI/Rolfe Industries	28022
Spears/Uncle Sam	
SC Hyd. Eng./Alb. Hyd.	20-4001A100
Norgren/Filtration Systems	Norgren P/N 375-02-081-44
Applied	K101-1216
Applied	K101-1620

56363-3 & 56363-4	2 hp, Air motor rebuilding kit - Gast Mfg. Corp. K208	800-335-4981
95SDJ0300	Order # 14744	717-832-8873
95SDJ0301	Order # 14744	717-832-8873
95SDJ0299	Order # 14744	717-832-8873
95SDJ0298	Order # 14744	717-832-8873
		518-383-2244
STK NO. 2DC09		518-869-1414
		800-882-6466
	12 teeth, 3/8" bore, set screw, aluminum	800-882-6466
	32 teeth, 3/8" bore, aluminum	800-882-6466
EVO3311	Head kit #61-76-0123-PP2, plunger kit #61760160, head as	518-383-2244
960910587	Uses spare parts kit P/N SP-44	518-383-2244
92046763	Uses spare parts kit P/N SP-U1;18 GPD, 80 psi	518-383-2244
930908614	Uses spare parts kit P/N SP-U1;18 GPD, 80 psi	518-383-2244
EVO3312	Head kit #61-76-0123-SS1, plunger kit #61760160, head as	518-383-2244
413155 & 413156	Mark III, P.O. #954257-00, EQ. # PC4629A & B	518-383-2244
413154 & 413153	Mark III, P.O. # -00, EQ. # PC A & B 35 gpm	518-383-2244
528478	SandPIPER pneumatic diaphragm pump	518-383-2244
413825 & 413157	Mark III, P.O. #954257-00, EQ. # PC-4624A & B	518-383-2244
	Mark III	518-383-2244
489284	SandPIPER pneumatic diaphragm pump	518-383-2244
	Used on SandPIPER SB1-A Type SB-4-A	518-383-2244
	For SandPIPER EB-2-M pump, includes pilot valve kit	518-383-2244
	For SandPIPER EB-2-M pump, included in air end kit	518-383-2244
	0-120 psig out, 300 psig max in, 1" female in/out	518-371-4401
	1-3/8", Tg Carbide rotary/Si Carbide O-ring seat	518-423-2081
	1-3/8", Tg Carbide rotary/Si Carbide O-ring seat	518-423-2081
	1-3/8", Viton carbon rotary/ SC O-ring seat	518-423-2081
	2 required on SandPIPER SB1-A Type 4, Buna N	518-383-2244
	4 required on SandPIPER EB2-M, neoprene rubber	518-383-2244
	Clear, flexible PVC tubing, 3/4" ID x 1.0" OD	732-329-3200
	Used on LMI model A181-95S metering pump	518-383-2244
	2-1/2" PVC, EPDM seal	518-235-1610
		518-462-5425

An up-to-date list is available from the maintenance manager.

NORLITE CORPORATON
Policy Number: OM 3-04
Effective Date: 9/03

PERFORMING DAILY, WEEKLY AND MONTHLY CALIBRATIONS

I. PURPOSE

Provide a consistent and reliable procedure for the daily, weekly and monthly calibration of emissions equipment.

II. SCOPE

Continuous Emissions Monitoring Equipment

III. RESONSIBILITIES

Instrumentation and Electrical Department

IV. PROCEDURES

See SOP's OM 3-07A thru OM 3-07I for procedures on how to perform calibrations.

See attachment OM 3-04A for the frequency of calibrations performed on each piece of equipment.

The Relative Accuracy Test Audits (RATA's) will be performed during the First Quarter of each year.

The quarterly Cylinder Gas Audits (CGA's) will be performed during the Second, Third and Fourth Quarter's of each year.

I. PURPOSE

Provide a list of instrument tag numbers.

II. SCOPE

Instrumentation Tags

III. RESONSIBILITIES

Instrumentation and Electrical Department

IV. PROCEDURES

Refer to Attachment OM 3-04A for list of instrument tag numbers.

NORLITE CORPORATON
Policy Number: OM 3-06
Effective Date: 9/03

PREVENTIVE MAINTENANCE-EMISSIONS EQUIPMENT

I. PURPOSE

Provide a consistent and reliable procedure on and when preventive maintenance is done on emission equipment.

II. SCOPE

Preventive Maintenance of Emissions Equipment

III. RESONSIBILITIES

Instrumentation and Electrical Department

IV. PROCEDURES

Preventive maintenance (pm's) is performed monthly and during planned kiln shutdowns. PM's will be completed on the following components.

Pressure Taps

The pressure taps are to be cleaned by reaming the inside of the tube out and making sure it is clear of material buildup or debris.

Drives

Clean the drives using a nitrogen blowout system.

Filters

Clean the filters by blowing them with air, rinse them off or replace them, depending on their condition.

Flowmeters

Flowmeters will be cleaned using a 50% HCL solution. Scrub the inside of the flowmeter with the solution until clean.

Scrubbers

Refer to Norlite Corporation Best Management Practices Plan (BMP), Appendix F, 2.3.4 for procedures.

Plugged Line

Take line out of service and flush line and fitting with solution of Acetic Acid. After Acetic Acid, rinse with water and replace parts. Place line back into service.

NORLITE CORPORATON
Policy Number: OM 3-07A
Effective Date: 9/03
Revised: 10/03

LOW PRESSURE CALIBRATION

I. PURPOSE

Provide a consistent and reliable procedure for the calibration of equipment for Low Pressure settings. (instrument calibrated in inches of water)

II. SCOPE

Continuous Monitoring Systems

III. RESPONSIBILITIES

Instrumentation and Electrical Department

IV. PROCEDURES

1. Attach communication device to transmitter.
2. Close isolation valves.
3. Attach pump and pressure calibrator to Hi side of pressure sensor.
4. Open Lo side of pressure sensor.
5. Open pump valve to check zero-take readings from communication device.
6. Close pump valve and pup up pressure to ¼ upper range value-take readings.
7. Pump pressure to ½ upper range value-take readings.
8. Pump pressure to ¾ upper range value-take readings.
9. Pump pressure to upper range value-take readings.
10. If readings are out of drift, adjust transmitter to pressure calibrator readings.
11. Put equipment back to normal operating condition.

NORLITE CORPORATON
Policy Number: OM 3-07B
Effective Date: 9/03
Revised: 10/03

HIGH PRESSURE CALIBRATION

I. PURPOSE

Provide a consistent and reliable procedure for the calibration of equipment for High Pressure settings. (instrument calibrated in pounds per square inch)

II. SCOPE

Continuous Monitoring Systems

III. RESPONSIBILITIES

Instrumentation and Electrical Department

IV. PROCEDURES

1. Attach communication device to transmitter.
2. Close isolation valves.
3. Attach pump and pressure calibrator to Hi side of pressure sensor.
4. Open pump valve to check zero-take readings from communication device.
5. Close pump valve and pump up pressure to ¼ upper range valve-take readings.
6. Pump pressure to ½ upper range value-take readings.
7. Pump pressure to ¾ upper range value-take readings.
8. Pump pressure to upper range value-take readings.
9. If readings are out of drift, adjust transmitter to pressure calibrator readings.
10. Put equipment back to normal operating condition.

NORLITE CORPORATON
Policy Number: OM 3-07C
Effective Date: 9/03
Revised: 10/03

TEMPERATURE THERMOCOUPLE CALIBRATION

I. PURPOSE

Provide a consistent and reliable procedure for the calibration of equipment for Temperature Thermocouple settings.

II. SCOPE

Continuous Monitoring Systems

III. RESPONSIBILITIES

Instrumentation and Electrical Department

IV. PROCEDURES

1. Attach communication device to transmitter.
2. Take sensor wires off transmitter and attach wires from temperature simulator in their place.
3. Dial in Low range value on temperature simulator-take readings from communications device.
4. Dial in value ¼ of upper range value-take readings.
5. Dial in value ½ of upper range value-take readings.
6. Dial in value ¾ of upper range value-take readings.
7. Dial in upper range value-take readings.
8. Adjust transmitter if necessary.
9. Put equipment back to normal operating condition.

NORLITE CORPORATON
Policy Number: OM 3-07D
Effective Date: 9/03
Revised: 10/03

SCRUBBER FLOW CALIBRATION

I. PURPOSE

Provide a consistent and reliable procedure for the calibration of equipment for Scrubber Flow settings.

II. SCOPE

Continuous Monitoring Systems

III. RESPONSIBILITIES

Instrumentation and Electrical Department

IV. PROCEDURES

1. Remove transmitter cover.
2. Unplug transmitter power and communication ribbon connector.
3. Attach simulator ribbon connector and power plug from simulator.
4. Plug in simulator to outlet power.
5. Dial simulator to Low range signal-take readings from amp meter and transmitter.
6. Dial in signal ¼ of upper range value-take readings.
7. Dial in signal ½ of upper range value-take readings.
8. Dial in signal ¾ of upper range value-take readings.
9. Dial in signal for upper range value-take readings.
10. If readings are out of drift, adjust transmitter to simulator signal reading.
11. Put equipment back to normal operating conditions.

NORLITE CORPORATON
Policy Number: OM 3-07E
Effective Date: 9/03
Revised: 10/03

INDUCED DRAFT FAN CURRENT CALIBRATION

I. PURPOSE

Provide a consistent and reliable procedure for the calibration of equipment for Induced Draft (ID) Fan Current settings.

II. SCOPE

Continuous Monitoring Systems

III. RESPONSIBILITIES

Instrumentation and Electrical Department

IV. PROCEDURES

1. Clamp amp clamp around each drive output wire-take readings.

2. Take amp reading from control room computer.

NORLITE CORPORATON
Policy Number: OM 3-07F
Effective Date: 9/03
Revised: 10/03

FLOWS (MICROMOTION) CALIBRATION

I. PURPOSE

Provide a consistent and reliable procedure for the calibration of equipment for Flows (Micromotion) settings.

II. SCOPE

Continuous Monitoring Systems

III. RESPONSIBILITIES

Instrumentation and Electrical Department

IV. PROCEDURES

1. Attach communication device to transmitter.
2. Change output reading from gallons per minute to pounds per minute.
3. Zero the totalizer.
4. Weigh bucket for tare weight.
5. Take sample in the basket and weigh-write down reading.
6. Write down totalizer reading form communication device and zero totalizer.
7. Take three samples and average.
8. If sample average and totalizer average is out of drift-redo test.
9. Put equipment back to normal operating condition.

NORLITE CORPORATON
Policy Number: OM 3-07G
Effective Date: 9/03
Revised: 10/03

DAILY pH (SCRUBBER) CALIBRATION

I. PURPOSE

Provide a consistent and reliable procedure for the calibration of equipment for Daily pH (Scrubber) settings.

II. SCOPE

Continuous Monitoring Systems

III. RESPONSIBILITIES

Instrumentation and Electrical Department

IV. PROCEDURES

1. Calibrate hand held pH tester.
2. Clean pH probes with acid.
3. Take sample of scrubber water and test with hand held tester.
4. Check reading against transmitter reading.
5. If readings are out of drift, attach communication device to the transmitter and standardize.
6. Two point calibrate if a new probe is installed.

NORLITE CORPORATON
Policy Number: OM 3-07H
Effective Date: 9/03
Revised: 10/03

SHALE FEED CALIBRATION

I. PURPOSE

Provide a consistent and reliable procedure for the calibration of equipment for Shale Feed settings.

II. SCOPE

Continuous Monitoring Systems

III. RESPONSIBILITIES

Instrumentation and Electrical Department

IV. PROCEDURES

1. Close silo plate to shut off shale feed and auto zero feeder.
2. Weigh buckets for tare weight.
3. Calculate belt speed by averaging three tachometer readings.
4. Open silo plate.
5. Take three shale sample grabs and average the weights.
6. Calculate the tons per hour and compare this to the current shale set point.
7. If the readings are not within drift, adjust the feeder and take two more sample grabs.
8. Put equipment back to normal operating condition.

NORLITE CORPORATON
Policy Number: OM 3-07I
Effective Date: 9/03
Revised: 10/03

LIME FEEDER CALIBRATION

I. PURPOSE

Provide a consistent and reliable procedure for the calibration of equipment for Lime Feeder settings.

II. SCOPE

Continuous Monitoring Systems

III. RESPONSIBILITIES

Instrumentation and Electrical Department

IV. PROCEDURES

1. Run feeder at designated setting.
2. Measure revolutions per minute of Helix drive shaft.
3. Calculate output of feeder.
4. Compare output of feeder to target weight-if outside drift, adjust drive speed.
5. Put equipment back to normal operating condition.

NORLITE CORPORATON
Policy Number: OM 3-07J
Effective Date: 9/03
Revised: 10/03

SCRUBBER TANK LEVEL

I. PURPOSE

Provide a consistent and reliable procedure for the calibration of equipment for Scrubber Tank Level settings.

II. SCOPE

Continuous Monitoring Systems

III. RESONSIBILITIES

Instrumentation and Electrical Department

IV. PROCEDURES

1. Attach communication device to transmitter.
2. Close isolation valves.
3. Open drain valve to Hi side of pressure sensor: make sure all fluid drains.
4. Close drain valve to Hi side of pressure sensor.
5. Attach pump and pressure calibrator to Hi side of pressure sensor.
6. Open Lo side of pressure sensor (if you are looking at a differential pressure)
7. Open pump valve to check zero-take readings from communication device.
8. Close pump valve and pup up pressure to ¼ upper range value-take readings.
9. Pump pressure to ½ upper range value-take readings.
10. Pump pressure to ¾ upper range value-take readings.
11. Pump pressure to upper range value-take readings.
12. If reading are out of tolerance, adjust transmitter to pressure calibrator readings.
13. Put equipment back to normal operating condition.
14. See Attachment OM 3-04B for the operational and waste feed cut criteria.

NORLITE CORPORATON
Policy Number: OM 3-07K
Effective Date: 9/03

CONTINUOUS EMISSIONS MONITORING SYSTEM-CALIBRATION

I. PURPOSE

Provide a procedure for the calibration of the Continuous Emissions Monitoring System (CEMS).

II. SCOPE

Continuous Emissions Monitoring Systems

III. RESPONSIBIILITIES

Instrumentation and Electrical Personnel (I & E)

IV. PROCEDURE

Calibration for CO-Low

1. Press and hold the blue CO-Low button on selected unit for 5 seconds. (The unit will automatically zero and span its self.)
2. Adjust the analyzer as necessary.
3. When the calibration is finished print out results.

Calibration for CO-Hi

1. Press and hold the blue CO-High button on selected unit for 5 seconds. (The unit will automatically zero and span its self.)
2. Adjust the analyzer as necessary.
3. When the calibration is finished print out the results.

Calibration for Oxygen

1. Press and hold blue Oxygen button on selected unit for 5 seconds. (The unit will automatically zero and span its self.
2. Adjust the analyzer as necessary.
3. When the calibration is finished print out the results.

NORLITE CORPORATON
Policy Number: OM 3-07L
Effective Date: 9/03

CONTINUOUS EMISSIONS MONITORING SYSTEM-LINEARITY TEST

I. PURPOSE

Provide a procedure for the linearity test of the Continuous Emissions Monitoring System (CEMS).

II. SCOPE

Continuous Emissions Monitoring Systems

III. RESPONSIBIILITIES

Instrumentation and Electrical Personnel (I & E)

IV. PROCEDURE

1. Perform Daily 24 Hour Cal Check.
2. Check Pressures and Flows for CEMS.
3. Perform online calibration for the analyzer. Zero and Span to Cal Values if needed.
4. Check DARS. Audit field for 20 second time period.
5. Connect audit gas equipment.
6. Record gas cylinder information on data sheet: EPA Protocol Gas, Cal Values, Expiration Date and Pressures.
7. Call Kiln Control Room and notify CEMS is to be placed OUT OF SERVICE for Audit.
8. Place CEM OUT OF SERVICE.
9. Connect Outlet of Audit Gas Cylinder to outlet of Cal Line going to the probe.
10. Start Audit for DARS (Audit Button), (On Screen Lower Right0.
11. Perform 3 Audit runs as follows:
    - Run 1. LOW, MID, HIGH (Check analyzers to see if you have enough gas)
    - Run 2. MID, LOW HIGH
    - Run 3. LOW, MID, HIGH
12. Open 1st Gas Cylinder and flow gas (10 lpm) wait until readings become stable on the Analyzer and DARS. Check Audit results for pass/fail limits (1st Run).
13. Let reading stabilize for 1 minute, Start 2nd Audit Gas, Repeat Step 12.
14. Let reading stabilize for 1 minute, Start 3rd Audit Gas, Repeat Step 12.
15. Perform Run 2 – Repeat Steps 12 – 15.
16. Perform Run 3 – Repeat Steps 12 – 15.
17. Stop Audit when readings return to normal. Print and record data for each run on the Field Data Sheet.
18. If CEMS Passes Linearity Test, disconnect audit equipment, reconnect Cal gas line to CEMS and flow Zero Gas (Blue Button) for 3 minutes. Check for leaks, analyzer should have a stable zero reading.
19. Place CEMS back into SERVICE, Record events in CEMS Log Book. Contact Kiln Control Room.
20. Backup Audit file by: COPYING Audit file from CEDAR to removable zip drive.

NORLITE CALIBRATION ERROR DATA SHEET

SOURCE:	NORLITE CORP.
MONITOR:	
SERIAL NUMBER:	

DATE:	
LOCATION:	
TIME:	

ANALYZER RANGE:	

CYLINDER	LOW	MID	HIGH
TANK I.D. #			
EXPIRATION			
TANK PSI			

RUN NUMBER	CALIBRATION VALUE	MONITOR RESPONSE	DIFFERENCE		
			LOW	MID	HIGH
1-LOW					
2-MID					
3-HIGH					
4-MID					
5-LOW					
6-HIGH					
7-LOW					
8-MID					
9-HIGH					
		MEAN DIFF.			
		CAL. ERROR*			

AUDIT POINTS	LOW	MID	HIGH
	0-20%	30-40%	70-80%
CO			
LOW (200 ppm)	0-40 ppm	60-80 ppm	140-160 ppm
HIGH (3000ppm)	0-600 ppm	900-1200 ppm	2100-2400 ppm
OXYEN (25%)	0-2%	8-10%	14-16%

* CAL. ERROR SPECIFICATION

CO ANALIZER = <5% SPAN CAL. ERR = $\frac{\text{MEAN DIFF.}}{\text{RANGE}}$ X 100

LOW = 10 ppm HIGH = 150 ppm

OXYGEN ANALIZER = 0.5%

NORLITE CORPORATON
Policy Number: OM 3-07M
Effective Date: 6/04
Revision Date: 1/05, 2/05

STACK GAS FLOW METER

I. PURPOSE

Provide a consistent and reliable procedure for the Stack Gas Flow Meter.

II. SCOPE

Stack Gas Flow Meter

III. RESPONSIBIILITIES

Compliance/I & E Department

IV. PROCEDURE

MONTHLY

1. The Stack Gas Flow Meter will be visually inspected each month.
    a. Visually inspect electrical connections, enclosures, electrical cables and the flow element mounting connections for any signs of physical damage and/or deterioration.
    b. Compare readings from control room to reading in field.

QUARTERLY

1. Each quarter the stack probe will be removed from the stack and cleaned.
    a. Remove stack probe and clean.
    b. Look for any signs of damage and/or deterioration.

ANNUAL

1. A RATA will be conducted on an annual basis for certification.
    a. Certify instrument is in compliance.

NORLITE CORPORATION

INSTRUMENT CALIBRATION DATA SHEET

NAME: STACK GAS FLOW METER KILN #1

MFG: FCI

MODEL#: GF90

SERIAL#: 244110A

CERT. DUE: 11/05

TAG#: FT-5555

LOCATION: KILN 1 MCC

METER READING FIELD:

METER READING CONTROL ROOM:

METER READING DIFFERENCE:

VISUAL INSPECTION (STACK):

VISUAL INSPECTION (ELECTRONICS):

DATE:

INSTRUMENT TECHNICIAN:

DRIFT ACCEPTANCE +/- 5%

COMMENTS:

QUARTERLY CLEANINGS:

MARCH

JUNE

SEPTEMBER

DECEMBER

NORLITE CORPORATION

INSTRUMENT CALIBRATION DATA SHEET

NAME: STACK GAS FLOW METER KILN #2

MFG: FCI

MODEL#: GF90

SERIAL#: 246163

CERT. DUE: 11/05

TAG#: FT-5555

LOCATION: KILN 2 MCC

METER READING FIELD:

METER READING CONTROL ROOM:

METER READING DIFFERENCE:

VISUAL INSPECTION (STACK):

VISUAL INSPECTION (ELECTRONICS):

DATE:

INSTRUMENT TECHNICIAN:

DRIFT ACCEPTANCE +/- 5%

COMMENTS:

QUARTERLY CLEANINGS:

MARCH

JUNE

SEPTEMBER

DECEMBER

NORLITE CORPORATON
Policy Number: OM 3-07N
Effective Date: 9/03

LIME BLOWERS

I. PURPOSE

Provide a consistent and reliable procedure for the Lime Blowers.

II. SCOPE

Continuous Monitoring Systems

III. RESPONSIBIILITIES

I & E Department

IV. PROCEDURE

MONTHLY

1. The Lime Blowers will be visually inspected each month.
    a. Visually inspect each blower for any signs of physical damage and/or deterioration. Record any comments on calibration sheet.
    b. Record flow meter reading on calibration sheet.

NORLITE CORPORATION

INSTRUMENT CALIBRATION DATA SHEET

NAME: VORTEX FLOW METER #1	
MFG: YOKOGAWA	FLOW METER READING:
MODEL#: DY	VISUAL INSPECTION:
SERIAL#: 3353B033 2003	DATE:
TAG#: VF-101	
LOCATION: LIME SILO	
NAME: VORTEX FLOW METER #2	
MFG: YOKOGAWA	FLOW METER READING:
MODEL#: DY	VISUAL INSPECTION:
SERIAL#: 3353B034 2003	DATE:
TAG#: VF-102	
LOCATION: LIME SILO	
NAME: VORTEX FLOW METER #3	
MFG: YOKOGAWA	FLOW METER READING:
MODEL#: DY	VISUAL INSPECTION:
SERIAL#: 3353B031 2003	DATE:
TAG#: VF-103	
LOCATION: LIME SILO	
COMMENTS:	

NORLITE CORPORATON
Policy Number: OM 3-08
Effective Date: 9/03

CRITICAL SPARE PARTS

I. PURPOSE

Provide a list of critical spare parts.

II. SCOPE

Critical Spare Parts List

III. RESONSIBILITIES

Instrumentation and Electrical Department

IV. REFERENCES

Refer to attachments OM 3-04C and OM 3-04D.

I. PURPOSE

Provide a table that indicates the inspection frequencies of air pollution control (APC) equipment and continuous emissions monitoring (CEM) equipment.

II. SCOPE

APC and CEM equipment

III. RESONSIBILITIES

Kiln Operations and Instrumentation and Electrical Department

IV. PROCEDURES

Below is a table that summarizes the inspection frequencies of the air pollution control (APC) equipment and continuous emissions monitoring (CEM) equipment.

Name	Inspection Frequency
Baghouse Systems	Inspected twice per shift (four inspections/24hrs.)
Multiclones	Inspected twice per shift (four inspections/24hrs.)
Lime Feeders and Blowers	Once per shift.
Scrubber Systems	Once per shift
Soda Ash Building	Once per shift
Heat Exchanger and Primary Air Fans	Once per shift
Raw Shale Belts	Once per shift
Air Compressors	Once per shift
Fuel Farm	Daily
CEM/CMS equipment	Each time instruments are calibrated, they are also inspected. The calibration frequency is located in OM 3-04A. Inspection also occurs during Kiln Shutdowns.

NORLITE CAL. SHEET CHECK LIST KILN 1

CALIBRATION TITLE	TAG#	INSTRUMENT TITLE	CALIBRATION FREQUENCY	INSTRUMENT ACCURACY[2]
BAGHOUSE INLET TEMP	TT-4302	ROSEMOUNT 3044C	Monthly	+/- 0.18 F
BLOWDOWN FLOW	FT-1508	FISCHER PORTER 10D1475	Monthly	+/- 0.5% of flow rate
KILN EXIT TEMP	TT-4303	ROSEMOUNT 3044C	Monthly	+/- 0.18 F
HOOD PRESSURE D/P	DPT-5203	ROSEMOUNT 1151 DP	Monthly	+/- 0.1
I.D. FAN CURRENT	IDF-4301	ABB (ACS 600)	Monthly	± 1.0% of range
LGF FEED RATE	MM-4301	MICROMOTION DL100	Monthly	+/- 0.15% of flow rate
SCRUBBER pH A	4401A	ROSEMOUNT 2081 pH	Daily	+/- 0.02 pH
SCRUBBER pH B	4401B	ROSEMOUNT 2081 pH	Daily	+/- 0.02 pH
SCRUBBER RECIRC FLOW A	FT-4403A	FISCHER PORTER 10D1475	Monthly	+/- 0.5% of flow rate
SCRUBBER RECIRC FLOW B	FT-4403B	FISCHER PORTER 10D1475	Monthly	+/- 0.5% of flow rate
SHALE FEED	AR-4301	ACCURATE MPC200	Monthly	± 0.25–1.0% of rate
VENTURI D/P	DPT-4401	ROSEMOUNT 1151 DP	Monthly	+/- 0.1
SCRUBBER TANK LIQUID LEVEL	LT_101	Rosemount 1151 DP	Monthly	+/- 0.1
DRY SORBENT FEED RATE	Lime_Feed	ACCURATE 602M	Monthly	+/- 2%
DRY SORBENT CARRIER FLOW RATE	Lime_Flow	Yokogawa Model DYA-S1	MONTHLY[1]	na

na-not applicable

[1]-Based on manufactures recommendation, no calibration is needed, but an inspection is conducted.

[2] -Based on manufactures literature.

NORLITE CAL. SHEET CHECK LIST KILN 2

CALIBRATION TITLE	TAG#	INSTRUMENT TITLE	CALIBRATION FREQUENCY	INSTRUMENT ACCURACY[2]
BAGHOUSE INLET TEMP	TT-2404	ROSEMOUNT 3044C	Monthly	+/- 0.18 F
BLOWDOWN FLOW	FT-2508	FISCHER PORTER 10D1475	Monthly	+/- 0.5% of flow rate
KILN EXIT TEMP	TT-2105	ROSEMOUNT 3044C	Monthly	+/- 0.18 F
HOOD PRESSURE D/P	DPT-2104	ROSEMOUNT 1151 DP	Monthly	+/- 0.1
I.D. FAN CURRENT	IDF-2401	ABB (ACS 600)	Monthly	± 1.0% of range
LGF FEED RATE	MM-2401	MICROMOTION DL100S223SU	Monthly	+/- 0.15% of flow rate
SCRUBBER pH A	2509A	ROSEMOUNT 2081 pH	Daily	+/- 0.02 pH
SCRUBBER pH B	2509B	ROSEMOUNT 2081 pH	Daily	+/- 0.02 pH
SCRUBBER RECIRC FLOW A	FT-2507A	FISCHER PORTER 10D1475	Monthly	+/- 0.5% of flow rate
SCRUBBER RECIRC FLOW B	FT-2507B	FISCHER PORTER 10D1475	Monthly	+/- 0.5% of flow rate
SHALE FEED	AR-2401	ACCURATE MPC200	Monthly	± 0.25–1.0% of rate
VENTURI D/P	DPT-2303	ROSEMOUNT 1151 DP	Monthly	+/- 0.1
SCRUBBER TANK LIQUID LEVEL	LT_101	Rosemount 1151 DP	Monthly	+/- 0.1
DRY SORBENT FEED RATE	Lime_Feed	ACCURATE 602M	Monthly	+/- 2%
DRY SORBENT CARRIER FLOW RATE	Lime_Flow	Yokogawa Model DYA-S1	MONTHLY[1]	na

na-not applicable

[1]-Based on manufactures recommendation, no calibration is needed, but an inspection is conducted.

[2] -Based on manufactures literature

NORLITE CAL. SHEET CHECK LIST MISC.

APPROVED BY :

CALIBRATION TITLE	INSTRUMENT TITLE	SYSTEM PARAMETERS	CALIBRATION FREQUENCY
LIME FEEDERS	ACCURATE	1-500 LBS/HR	Monthly
LIME TAG# AC-101 AC-102 AC-103			
CEM	CISCO	O2 / COC / HRA	Daily
PRIMARY AIR VENT (LEL)	MSA	20% - 30%	Monthly
O2 / LEL SENSORS	MSA		Monthly
QUARTERLY CAL. (JAN.,APRIL,JULY,OCT.)		0-25 / 0-50	Monthly
FINISH PLANT PRESSURES	DWYER	0-15 "H2O	Monthly
FIRE PUMP TEST	JOSELYN CLARK	TEST RUN	Monthly
FUEL FARM VENT (O2)	SENSIDYNE	0-10 %	Monthly
PUMP SEAL ALARM CHECK	ECHOTELL/UNITED ELECTRIC	PASS/FAIL	Monthly

Kiln # _____

Date: _____

Norlite Corporation

MACT OPERATING PARAMETER LIMITS (OPLs)

OM 3-04B

Test Start: _____

Test End: _____

PARAMETER	ALARM SETPOINT	OPCO	WFCO	STATUS	NORLITE SIGN OFF / DATE	NYS DEC SIGN OFF / DATE
INSIDE						
MAXIMUM TOTAL WASTE (LGF) FEED RATE (hra)	9 gpm	10.2 gpm	10.3 gpm	Alarm OPCO WFCO		
MAXIMUM PUMPABLE WASTE FEED RATE (hra)	9 gpm	10.2 gpm	10.3 gpm	Alarm OPCO WFCO		
MAXIMUM SHALE FEED RATE (hra)	21.0 tph	21.0 tph	22.0 tph	Alarm OPCO WFCO		
MAXIMUM FLUE GAS FLOW RATE (ID FAN CURRENT) (hra)	401 amps	403 amps	405 amps	Alarm OPCO WFCO		
MINIMUM SCRUBBER BLOWDOWN RATE (hra)	15.5 gpm	15.2 gpm	15.0 gpm	Alarm OPCO WFCO		
MINIMUM SCRUBBER LIQUID pH (hra) METER: A B	8.0	8.0	7.9	Alarm OPCO WFCO		
KILN PRESSURE ("w.c.)	-0.03" w.c.	-0.02" w.c.	0.0" w.c.	Alarm OPCO WFCO		
CARBON MONOXIDE - LGF (hra)	60 ppm	75 ppm	100 ppm @ 7% O_2	Alarm OPCO WFCO		
OUTSIDE						
MINIMUM KILN BACK-END TEMPERATURE (hra)	876 °F	871 °F	866 °F	Alarm OPCO WFCO		
MAXIMUM BAGHOUSE INLET TEMPERATURE (hra)	390 °F	398 °F	400 °F	Alarm OPCO WFCO		
MINIMUM VENTURI PRESSURE DROP (hra)	2.5" w.c.	2.3" w.c.	2.0" w.c.	Alarm OPCO WFCO		
SCRUBBER TANK LIQUID LEVEL (hra) (% OF TANK HEIGHT)	45%	42%	40%	Alarm OPCO WFCO		
MINIMUM SCRUBBER RECIRCULATION RATE (hra) PUMP: A B	180 gpm	177 gpm	175 gpm	Alarm OPCO WFCO		
MINIMUM LIME FEED RATE (lb/hr) (hra) (both WFCO keys in)	220	210	200	Alarm OPCO WFCO		
MINIMUM LIME CARRIER FLOW RATE (cfm) Feeder # ___	200	175	150	Alarm OPCO WFCO		

NORLITE CORPORATION
CLEAN AIR ACT
MACT WFCO/OPCO PARAMETERS
SPAN LIMITS
OM 3-04B

Kiln #: _____ Test Start: _____

Date: _____ Test End: _____

PARAMETER	SPAN LIMITS	OPCO	WFCO	STATUS	NORLITE SIGN OFF / DATE	NYS DEC SIGN OFF / DATE
INSIDE						
TOTAL WASTE (LGF) FEED RATE	0-20 gpm	19 gpm	20 gpm	OPCO WFCO		
SHALE FEED RATE	0-40 tph	35 tph	40 tph	OPCO WFCO		
FLUE GAS FLOW RATE (ID FAN CURRENT)	0-500 amps	475 amps	500 amps	OPCO WFCO		
SCRUBBER BLOWDOWN RATE	KILN 1 0-50 gpm KILN 2 0-67 gpm	45 gpm 52 gpm	50 gpm 67 gpm	OPCO WFCO		
SCRUBBER LIQUID pH METER: A B	3.5 - 10.5	10.0	10.5	OPCO WFCO		
KILN PRESSURE ("w.c.)	-2.0 to +1.0	-1.8, +0.8	-2.0, +1.0	OPCO WFCO		
OUTSIDE						
MINIMUM KILN BACK-END TEMPERATURE	0-1400 °F	1300 °F	1400 °F	OPCO WFCO		
BAGHOUSE INLET TEMPERATURE	0-700 °F	600 °F	700 °F	OPCO WFCO		
VENTURI PRESSURE DROP	3.5" -10" w.c.	9.8" w.c.	10.0" w.c.	OPCO WFCO		
SCRUBBER TANK LIQUID LEVEL (% OF TANK HEIGHT)	0-100%	95%	100%	OPCO WFCO		
SCRUBBER RECIRCULATION RATE PUMP: A B	0-250 gpm	245 gpm	250 gpm	OPCO WFCO		
LIME FEED RATE (lb/hr) Feeder # ____	0-500	450	500	OPCO WFCO		
LIME CARRIER FLOW RATE (cfm)	0-300	280	300	OPCO WFCO		

MOTOR LIST (POLE BARN)

3/5/03

QTY	HP	FRAME		RPM	VOLTAGE	PHASE
1	400	587T		1200	480	3
1	200	449T		1200	480	3
1	150	445T		1800	480	3
2	100	405T		1800	480	3
1	60	364T		1800	480	3
1	50	365T		1200	480	3
2	40	324T		1800	480	3
1	40	324TCE	HAZ. LOCATION	1800	480	3
1	40	324TS		3600	480	3
1	30	286TS		3600	480	3
1	30	286T		1800	480	3
1	25	284TS		3600	480	3
1	25	284T		1800	480	3
1	25	284T	HAZ. LOCATION	1800	480	3
1	15	254T		1800	480	3
1	15	254T		3600	480	3
1	15	215T		3600	480	3
1	10	215T		3600	480	3
1	10	215T		1800	480	3
1	10	256T		1200	480	3
1	5/2.2	254T		.1800/1200	480	3
1	25 KVA	TRANS.	OUTDOOR	480V PRI.	120/240 SEC	1
1	150 KVA	TRANS.	INDOOR	480V PRI.	120/208 SEC	3
1	100	DRIVE				

A more up-to-date list is available from the I E department.

MOTOR LIST (TRAILER)

6/10/03

QTY	HP	FRAME		RPM	VOLTAGE	PHASE
1	7.5	213T		3600	480	3
1	5	184T		3600	480	3
1	5	184TC		3600	480	3
1	5	184T		1800	480	3
0	2	145T		1800	480	3
2	2	145TC		1800	480	3
1	1.5	182T		1200	480	3
1	3/4	56C		1800	90VDC	
1	3/4	56C		1200	480	3
1	3/4	56C		1800	480	3
2	1/2	56C		1800	480	3
1	1/2	56		1800	480	3
1	1/2	56C		1800	90VDC	
2	1/4			53	90VDC	
1	1/6			1800	115	1
2	0.08	42CZ		2900-3400	115/230	1
2	1/2	B56	**Unimount**	1800	480	3
2	1/6	446		1050	230	1
1	1/6			1700	115	1
1	20	DRIVE				
1	30	DRIVE	**(used)**			

A more up-to-date list is available from the I E department.

INSTRUMENTATION SPARES

MANUFACTURER	SIZE	TYPE	QUANITY	RANGE
Fischer Porter	4"	Flow	3	
Fischer Porter	1 1/2"	Flow	3	
Fischer Porter	1"	Flow	3	
Rosemount		Pressure	2	0 - 10" H_20
Rosemount		Pressure	2	0 - 15" H_20
Rosemount		Pressure	2	0 - 200 psi
Rosemount		Pressure	1	0 - 60" H_20
Rosemount		Pressure	1	0 - 6" H_20
Rosemount		Pressure	1	0 - 110" psi
Rosemount		Pressure	1	(-)2.0 - 1.0" H_20
Rosemount		Pressure	2	0 - 20 psi
Rosemount		Temperature	5	0 - 100°c
Worcester		Valve Actuator	2	Series 75
Worcester		Valve Actuator	2	Series 75
Sensorex		Ph probe	10	S660CD
Dwyer		Photohelic	3	
CEM Equipment		Regulator	4	
CEM Equipment		Stone Filter/Gaskets	10	
CEM Equipment		Paper Filters	10	
CEM Equipment		Vacuum Pump	3	
CEM Equipment		Perma Pure Filter	2	
BHA CPM 750		Bag Leak Detector	1	0-100%

A more up-to-date list is available from the I E department.

NORLITE CORPORATON
Policy Number: OM 4-01
Effective Date: 9/03

CONTINUOUS MONITORING SYSTEM

I. PURPOSE

Provide a procedure to ensure the correct operation of the Continuous Monitoring System (CMS).

II. SCOPE

CMS

III. RESPONSIBIILITIES

Instrumentation and Electrical Personnel (I & E)

IV. PROCEDURES

The CMS runs continuous for 24 hours a day, seven days a week and 365 days a year. Therefore, the main function is to keep the CMS calibrated and provide routine maintenance of the system. The following describes how the CMS is maintained on a daily basis.

1. Daily calibrations for the Continuous Emissions Monitoring (CEM) system are done on Kiln 1 (Train A and Train B) and Kiln 2 (Train A and Train B) to ensure correct reporting of data. See OM 4-01A for a copy of the CEM Daily QA/QC log sheet. The system is inspected each day to ensure correct data reporting, if maintenance of the system is required, it will be performed at that time.

2. Calibrations and maintenance are performed on non-CEM CMS as described in OM 3-06. The frequency these instruments are calibrated is located in OM 3-04A. The forms used to record the calibrations are OM 4-02A thru OM 4-02O.

3. Besides the Instrumentation and Electrical (I&E) department performing calibrations, the kiln control room operator is continually monitoring all instrument outputs. If a discrepancy in noticed with the instruments, I&E is called upon to check the instrument reading.

4. Should a problem develop within the workstation, PLC or DAS; contact I&E to look into the situation.

The only exception when the CMS system is shutdown is when a programming change to the PCL and DAS is needed. This would only occur when the kiln is not operating on hazardous fuels.

Norlite Corporation

Laboratory
Fuel Blending & Certification Guidelines

SOP#04-042
Revision #1

Date Prepared: 09/08/03
Prepare by: Prince Knight
Approved by:
Document Letter: A

1.0 Scope

The following procedures will provide guidelines for the tracking, blending and certification of Low Grade Fuel received into Norlite. Due to the presence of many variables, the following SOP will only act as a guideline and operational managers should be consulted for final decisions and certification.

2.0 References

Norlite Corporation's Hazardous Waste Management Permit under Article 27, Title 9; 6NYCRR 373.
Norlite Analytical Laboratory's Quality Manual
NYS DOH ELAP Manual
NELAC Manual Chapter 5.0 "Quality System"
Various Computer Program Manuals; See specific sections for any detailed references.

3.0 Safety

There are no special safety requirements required for this SOP.

4.0 Process / Required Materials / Software Programs

-Corel Quattro Pro
-Microsoft Excel
-Borland Q&A Report Writer (Database)
-BackupExec Tape Drive system
-Fuel Farm Blending and Tank Transfer sheet
-Norlite Laboratory analytical results (or other NYS DOH ELAP certified results)

5.0 Processes

5.1 LGF Tracking and Updating

1. Identify the LGF shipment to be tracked. Locate the certified analytical results and the Fuel Farm Tracking sheet with the entry that contains the off loading or transfer information.

2. Open the Corel Quattro Pro spreadsheet program to the file which contains the analytical information of the receiving tank.

3. Any existing material in the tank must be accounted for by using the "current" chemistry as the new starting chemistry of the tank with the associated gallons that were in the tank before the LGF material was off-loaded / transferred. This will ensure not only accurate tank analytical, but will also provide tracking and contact information for all future materials added to the tank.

4 . Add a new column of chemistry by adding the analytical information associated with the LGF material obtained from the certified analytical results. Determine the volume, in gallons, of the material added to the tank using one of the following methods:

-Certified weight ticket converted to gallons using the material's specific gravity.
-Fuel Farm PLC gauge readings of the receiving tank
- Manifested information provided by the generator.
-Any combination of the previous three if there is an error or malfunction that affects the volume calculation.

5. The tank spreadsheet will automatically calculate the final chemistry by computing the mass weighted average of each LGF entry and the starting chemistry of the tank. The final resulting chemistry will be displayed in the furthest right hand column labeled "Finish".

6. The Data Checking System (DCS) value at the bottom of each column entry must be compared to the DCS value located on the analytical results sheet. The DCS value should match to ensure no data entry errors have occurred. The DCS values of the Finish column and overall DCS value should also be compared to ensure no computational errors have occurred.

7. A new tank status sheet can be updated a this time by opening a daily tank status sheet which directly references the data cells of each individual tank. The program automatically updates the analytical information for each tank and only the tank levels require manual input based on the Fuel Farm transfer sheet documented gauge readings.

5.2 LGF Blending

1.Using a current tank status sheet, qualified laboratory or fuel farm personnel can forecast blends using the Corel Quattro Pro Program. By adjusting the levels of each tank accordingly, a theoretical blend can be projected by using the same mass weighted average calculation as the individual tank updates.

2. Forecasted blends should be based on facility operational issues such as metals and chlorine dilution, BTU heat value optimization, special handling waste streams and tank volumes.

3. A theoretical blend should be tested by inserting the projected analytical chemistry into a test Waste Analysis Plan (WAP) 2 sheet. (See LGF Certification 5.3) The DCS values listed on the theoretical blend should match the DCS on the WAP-2 sheet to verify no data entry errors have occurred. If the projected blend is "certifiable" using maximum LGF (10.1 gal/min) and the maximum heat value (62,000,000 BTU/hr) The blend may be given to the fuel farm. If the blend cannot be maximized in this way, either adjust the tank levels to ensure a certified blend, or obtain management direction to proceed with a "restricted" blend.

4. Provide the final theoretical blend to the fuel farm representative. Maintain a copy of the blend at the laboratory for further comparisons. When the fuel farm operators have finished the blend, obtain a copy of the Fuel Farm Transfer Sheet and locate the blend information.

5.3 LGF Certification

1. Update the receiving tank as indicated in section 5.1 of this SOP. Verify that the final DCS value compares to the DCS value located on the theoretical blend sheet. This not only ensures no data entry errors have occurred, but also that the blend was completed as intended.

2. Review the final tank chemistry and compare to permitted values located on the right hand side of the spread sheet. If any value falls outside of permit compliance, seek management input for re-blending or certification options. If there are no issues, assign the tank a WAP-2 sequential file number and update the tank sheet accordingly. Record the file number in the WAP-2 log book. Print both this file raw data sheet and the associated Kiln Oil tank sheet for permanent documentation.

3. Issue an official WAP-2 sheet for each Kiln by updating the information in the Borland Q&A Database program. Maximize the BTU/hr value by incrementally adjusting the Kiln Oil gal/min value and recalculating the WAP-2 sheet. Once the WAP-2 sheet is finalized, print a copy for each kiln and keep together with the raw data sheets.

4. Two, qualified laboratory personnel must review the WAP-2 sheet and compare at minimum, the following; File#, Tank identification, certified volume, DCS comparison, LGF rate, Kiln Oil rate, BTU/hr, Date released, tank contents and BTU/pound and specific gravity of the LGF. If all values check with the raw data sheets which have been checked versus the projected blend, the laboratory personnel may sign the WAP-2 sheet as certified and deliver to the Kiln operators for operational instructions.

6.0 Record Keeping

1. All original WAP-2 sheets must be returned from the kiln for monthly facility reporting and final storage in Norlite's Document Control System.

2. All computer data relating to tank spreadsheets and tank status sheets are organized and backed up on a daily basis. This is completed by running a back up macro in Quattro Pro and saving the file as the date. Furthermore, all sheets and Q&A database files are backed up daily and weekly using a tape drive back up system. Electronic storage media are stored in a locked, fireproof safe.

3. Fuel farm off-loading and transfer sheets are maintained as part of a daily packet which includes tank status sheets, projected blends and any other operational documentation needed to recreate the LGF activities of that day.

4. Original analytical data packets, generated by the laboratory are kept on file as computer database files and hard copy records. The data packets will contain the minimum information to reference all raw data results.